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***Curriculum Evolution at The Department of Baking
Technology (National Bakery School), DIT, Kevin St.
1998 - 2008***

What factors have brought about a change in curriculum?

A thesis submitted to the Dublin Institute of Technology in part fulfilment of the requirements for award of Masters (M.A.) in Third Level Learning and Teaching

by

Mary Kavanagh

2009

Supervisor: Dr. Noel Fitzpatrick

DIT Learning and Teaching Centre, Directorate of Academic Affairs

DECLARATION

I hereby certify that the material which is submitted in this thesis towards the award of the **Masters (M.A.) in Third Level Learning and Teaching** is entirely my own work and has not been submitted for any academic assessment other than part-fulfilment of the award named above.

Signature of candidate:

Date:.....

ABSTRACT

This thesis research set out to examine the factors which have contributed to curriculum evolution at the National Bakery School, Dublin Institute of Technology (DIT) from 1998 to 2008. It focused on a number of dimensions which have contributed to a radical shift in curriculum. Those dimensions include biographical, cultural, micro-political, structural, socio-historical, technological and scientific.

The research design was essentially a hermeneutical, interpretative case study using qualitative data gathering techniques. The primary research methods employed were interviews conducted with lecturing staff, and a survey conducted with students travelling to Germany for continuing professional development. An extensive literature review was conducted of primary and secondary sources to support the elements of the research design and contextual background.

The findings of the study clearly indicate a radical shift in curriculum in the Bakery School, in student intake and in pedagogies since 1998, and that this shift was caused by multiple factors which converged in a short space of time: external factors such as radical changes in the bakery industry, in consumer patterns and in the economy, and internal factors such as modularisation, the increased use of technology and a change in student profile.

The study revealed that other external and internal factors are emerging such as a downturn in the economy, proposed changes to fee support structures and organisational re-structuring and re-location which are likely to impact further on curricula in the School. The study concludes with recommendations arising to the National Bakery School and to future students.

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Glossary of Terms /Abbreviations

APEL	Accreditation of Prior Experiential Learning
APL	Accreditation of Prior Learning
BSc	Bachelor of Science
CAO	Central Applications Office
CBP	Chorleywood Breadmaking Process
CIOMS	Council for International Organisation of Medical Sciences
CPD	Continuous Professional Development
CPDP's	Continuous Professional Development Programmes
CSO	Central Statistics Office
CV	Curriculum Vitae
DIT	Dublin Institute of Technology
ECTS	European Credit Transfer System
EU	European Union
FAS	Foras Aiseanna Saothair
FETAC	Further Education and Training Awards Council
FSAI	Food Safety Authority of Ireland
GI	Glycaemic Index
HACCP	Hazard Analysis Critical Control Point
HRT	Hormonal Replacement Therapy
MRSA	Methicillin-Resistant Staphylococcus Aureus
NBS	National Bakery School
NFQ	National Framework of Qualifications

Glossary of Terms /Abbreviations continued

NQAI	National Qualifications Authority of Ireland
NTDs	Neutral Tube Defects
QA	Quality Assurance
RDS	Royal Dublin Society
RTE	Radio Telefis Eireann
TD	Teacht Dail
UK	United Kingdom
USA	United States of America

CHAPTER ONE

Context of the Research

1.1 Introduction

The National Bakery School (NBS) situated in the Kevin Street campus of the Dublin Institute of Technology is the sole institution in Ireland providing bakery education and training to full-time and part-time students since 1935. At present the school offers students the opportunity to participate in either the part-time Professional Baking Courses or full-time three year Bachelor of Science (BSc) ordinary degree in Baking and Pastry Arts Management with the option of an exit award of Higher Certificate in Baking and Pastry Arts Management on successful completion of years one and two of the three year programme. In order to understand curriculum change in the National Bakery School, it is necessary first of all to examine how the School was established and to discuss its early history.

Technical education was, and still is, provided in Ireland under the provisions of the Vocational Educational Act 1930 which is concerned with continuing and technical education White (2001, p. 32). The Vocational Educational Act 1930, according to Duff, Hegarty and Hussey (2000, p. 45), set about defining the scope of technical education to include 'education pertaining to trades, manufacturers, agriculture, commerce and other industrial pursuits and science, art, music and physical training'. Meanwhile O'Dowd (1985) states that the Act recommended that attendance at a technical school be compulsory in the first two years of apprenticeship to skilled trades. The Apprenticeship Act 1931 provided for regulation of apprentices in certain trades. It transpired that a number of trades, inclusive of bakery, had previously omitted to introduce any formal schemes to develop education and training for apprentices. It was this 1931 Act which assisted in bringing about formalised bakery education. In 1935 the National Bakery School or 'Dublin Bakery School' as it was known then, was founded by the Dublin Branch of the Bakers', Confectioners' and Allied Workers' Amalgamated Union with a view to formalising bakery education. Initially classes were held at the union premises at 37 Lower Gardiner Street. John Swift (1896-1990) General Secretary of the Dublin Branch of the Bakers', Confectioners' and Allied Workers' Amalgamated Union was instrumental in its foundation. Swift chaired the Advisory Committee from 1937 until 1967 cited in Saothair 15 (1990, p. 9) Journal of the Irish Labour History Society. Swift (2001, p. 77) states that the founder of the NBS perceived that:

The acquisition of knowledge, particularly of the academic kind, was not regarded by Swift as an end in itself. He perceived it as an instrument to not only develop his full potential but facilitate his more effective participation in society.

The history of bakery education in Ireland is unusual in that its origin is in bakery trade unionism. Interestingly bakery trade unionism records in Ireland date back to January 5th 1862, The Minute Book of The Society of Saint Anne or Bakers' Association are held at the Irish History Labour Society Museum, Haddington Road, Dublin.

1.1.2 Bakery Apprenticeship Programme

In 1937 the City of Dublin Vocational Education Committee undertook the management and responsibility of the School. That year classes commenced for bakery apprentices in Kevin Street. It was envisaged that formal education would promote the welfare and work conditions of bakery employees, enhance promotional prospects and alleviate the need for students to travel to Britain for training. This practice of travelling to Britain was restricted to the well-off sons of master bakers O'Dowd (1985, p. 2). One such student was Alfred Bewley son of Ernest Bewley founder of Bewley's Bakeries who attended Leeds Bakery College in 1937 Murdoch (2002, p 45).

Today Ireland no longer relies on the United Kingdom for advanced bakery education. Ireland is leading the field in the provision of bakery education while attracting many International students. Currently the National Bakery School, Southbank University London, offers two full-time courses, a Foundation Degree in Baking Technology and a Diploma of the National Bakery School in Craft Studies and part-time courses in creative techniques (cake decoration).

Initially Bakery Apprenticeship was a four year period within a work setting with compulsory attendance at classes in the first two years of apprenticeship. Tuition comprised of one class in bread-making to two in confectionery. This was believed to be a balanced level of instruction. Students undertook practical and written examinations with an 80% attendance necessary to undertake examinations. On completion of the course students were awarded the National Bakery School Bakery Certificate. In 1939 the first bakery students undertook the City and Guilds of London Institute examinations with seven successfully passing. Enrolment for journeymen bakers began in 1938 with 39 enrolling for classes along with 69 bakery apprentices. Journeymen bakers (derived from the French word 'jour' meaning day) were travelling bakers who were appointed on a daily basis to various bakeries who sought substitute workers or replacements. The Bakery Union at the time orchestrated and managed this service. An evening class in ancillary science also commenced in 1939 and was voluntary for apprentices O'Dowd (1985, p. 5).

From the foundation of the NBS there was no significant curriculum change until 1954 when the first day release began for bakery apprentices. This extended the hours of tuition from three to six hours. Prior to that the students attended evening classes for a three hour duration. Recruitment of additional staff was undertaken as the NBS expanded, in 1954 a second teacher was employed while currently the School has six lecturers. This was due to the increase in student numbers with the introduction of female apprentices, the inclusion of students from outside Dublin and the introduction of the whole-time Bakery Production and Management course in 1972.

The NBS will celebrate seventy-five years in existence in 2010. It is still located in Kevin Street, but is under the directorship of the Faculty of Tourism and Food. At a special meeting 10th June 1997 the Governing Body of the Dublin Institute of Technology approved the President's proposal on the Faculty, School and Department structures within the Institute. The course document (2003) for the Certificate in Baking & Pastry Arts Technology and Management states that the following proposal was approved:

The Department of Baking Technology could continue to use the title "National Bakery School" externally provided it was clearly understood that it has department status within the DIT. (3.15 Bakery:Governing Body 10/6/1997)

Despite the challenges it has been confronted with The National Bakery School or The Department of Baking Technology has survived and retained its identity.

1.2 Background

My interest in this topic stems from my own professional training and practice. I am a graduate of the NBS, having studied and completed the Diploma in Bakery Production and Management course from 1982 – 1985 and have been a lecturer there since 1998. I also have a connection with its founders in that I have been very fortunate to have had Mr. Sam Anthony, a Welshman and graduate of the Birmingham Bakery School, as a lecturer. He was the first bakery instructor employed at the NBS. Another lecturer at the time was Mr. Robert Darcy, a senior science lecturer in Kevin Street. His connections with the bakery and milling trade date back to 1924 when he held a position at the Dublin Port Milling Company.

Baking is an ancient craft. Kane (2008) states that it originated in Egypt with the first bakery built there around 2500 B.C. to feed the thousands of workers, during the building of the pyramids of Giza. The craft of baking was passed down from generation to generation. This was reflected in the student intake at the NBS and continued to be the case until the whole-

time Diploma in Bakery Production and Management commenced. Students from a non-bakery background and wanting to undertake that course were required to have at least six months practical experience in a work setting. I was one such student. This practice ceased when students applied through the Central Applications Office.

In the last decade I have witnessed a major shift in curriculum at the NBS, hence I feel compelled to explore this phenomenon further. The current Head of the NBS since 1988 is Mr. Derek O'Brien, he has been an ambassador for the championing of good quality bread and it is during his term that the NBS has witnessed a major transformation. His predecessor, Mr. Dan Carey, was instrumental in the introduction of the first full-time course there in 1972. Both colleagues have had a significant influence on the School and its curriculum.

1.2.1 Whole-Time Bakery Technology Course (WBT)

O'Dowd (1985) narrates that in 1949 The Advisory Committee recommended the inauguration of a full-time course in bakery practice and technology. However, it was not until 1972 that this materialised with the introduction of a three year whole-time course known as the Whole-Time Bakery Technology (WBT) course which later became known as the DT200 course. It was designed to meet the needs of students wishing to attain supervisory or managerial positions where an understanding of the scientific principles and a broad knowledge of the bakery industry is essential. The subjects covered on the course were, practical bread-making and flour confectionery. The technologies of each, raw material testing, art, design and cake decoration, physics, organic and inorganic chemistry, microbiology and hygiene, business administration, financial control and cost accounting, production, planning and human relations also formed part of the curriculum. The course was later modified in 1995 to include computer applications and German language studies. To merit the Diploma in Bakery Production and management students were required to undertake and pass The City and Guilds of London Full Technological Certificate. In 1972 the compulsory school leaving age was raised from fourteen to fifteen which had a positive impact on student numbers. O'Dowd (1985) states, that in 1973 the school had 63 student apprentices and 8 full-time students attending the whole-time course. A later advancement at the NBS was the introduction of the Certificate in Cake Design & Decoration which was offered as a part-time two year course. Interestingly food has been associated with art since the time of Giuseppe Arcimboldo an Italian Artist of the 16th century. Another advancement in curriculum was the introduction of the Royal Institute of Public Health and Hygiene Course which all students were encouraged to undertake. Wharton (1983) in a Bakery World Trade Magazine, reported on an interview with Robert Darcy, senior science lecturer at NBS, who

witnessed many changes in bakery education, notably in the areas of hygiene, technology, wages, and the academic orientation of the Full-time Bakery Production and Management Course. It was this course which would eventually pave the way for the BSc Degree Programme.

Throughout their training and education students were afforded the opportunity to compete and exhibit their work at the annual Bakex Exhibition which included a trade competition held at the Royal Dublin Society (RDS). This commenced in 1981 and continued until the late '90's. Figures obtained from the NBS show that in 1987/88 there were 33 whole-time and 85 part-time students while corresponding figures for 1994/95 are 60 and 144.

There was very little change in curriculum practice at the NBS from 1972 until 2000. Since the beginning of the millennium major curricular changes have taken place. This research established the factors which have brought about such change, primarily in the areas of technology, science, culture, professional development, politics and the economy. Furthermore it assessed the impact of legislation such as the DIT Act 1992 and the Bologna Declaration 1999 signed by thirty one representatives of twenty nine EU member states including Ireland.

1.3 Rationale for this thesis research

As a member of staff at the NBS I have witnessed a major shift in curriculum practice over the last decade. I have felt intellectually compelled to explore this phenomenon further and assess what factors have brought about this change. In the year 2000 it was unimaginable that the NBS would offer a degree programme by 2006 and to the discerning statistician that the student numbers and retention figures at the NBS would elevate to such heights. Coincidentally this change occurred at a time when the economy was buoyant and there appeared to be unprecedented wealth.

The last decade in Ireland almost represents an idyllic era which has impacted on curriculum and bakery education. Factors such as increased disposable income, travel, and immigration have fuelled demand for luxury and ethnic items which has impacted on bakery education. Just as strong economic growth impacted on the bakery curriculum so too will the current downturn in the Irish economy have possible implications for bakery education which may impact on curriculum in the future. Clinch, Convery and Walsh (2001) in *After The Celtic Tiger* indicates that unemployment fell from 17% in the 1980's to under 4% in 2001. There was a favourable currency exchange rate between the euro and the dollar and also with the sterling. Energy prices were at an all time low. White (2001) cites a number of reasons for Ireland's performance including foreign investment, wage moderation, the peace process in

Northern Ireland and ultimately education which is seen as a catalyst for enhanced labour skills and productivity. The combination of these factors led to increased prosperity. This along with a growth in immigration, predominantly from eastern Europe, had implications for bakery education.

To illustrate curriculum change at the NBS a linear timeline of key developments is presented below.

1935 - Foundation of the National Bakery School

1937 – Bakery apprentice classes commence in Kevin Street

1954 – Introduction of day-release for bakery apprentices

1972 – Diploma in Bakery Production and Management Course commences

1999 – Bakery Apprentices sponsored by FAS train at the German Bakery Academy

2000 – Introduction of short part-time Professional Baking Courses

2003 – Higher Certificate in Baking and Pastry Arts Management

2006 – BSc. in Baking and Pastry Arts Management.

As acknowledged earlier, prior to 2000 the National Bakery School offered a part-time bakery apprentice course and a full-time diploma course in Bakery Production and Management. Since the cessation of the apprenticeship course and the discontinuation of the diploma course the NBS has offered other courses. In 2000 part-time Professional Baking Courses commenced, while in 2003 the Higher Certificate in Baking and Pastry Arts Management commenced. This was followed by a BSc in Baking and Pastry Arts Management in 2006. Appendix E contains the module descriptors for the subjects taught at the NBS for the Higher Certificate and BSc programmes.

The NBS has been very progressive in responding to the challenges it has been presented with in recent years. It has met the needs of students and the bakery industry alike. This response has impacted on a shift in curriculum practices.

1.4 Context of the research

The transition from the 20th to the 21st century was a challenging period at the Bakery School. Derek O'Brien, Head of the NBS, addressing the Educational Forum held in 1996 at DIT, Kevin Street, stated that, 'education is not the most immediate problem within the trade but it is an issue that has to be tackled' cited in the Bakery World Trade Journal Newsletter (1996:1 Jan/Feb). The objective of this forum was to define the current role of education for the bakery industry, while at the same time assess the future needs of the bakery industry. This included the possibility of working with FAS. Some problems were identified including the

cost issue surrounding day release schemes for apprentices. Other difficulties included travel and accommodation for students. It was proposed at that Forum that the apprenticeship be modernised from a four to a three year programme and that a FAS scheme be implemented. Incidentally at this time Ireland experienced many bakery closures. Despite modification to the Bakery Apprenticeship course student numbers gradually declined bringing about a cessation to the bakery apprentice course in 2000. This forum proved to be the foundation for curriculum change. Consequently a decision was made to modify the existing four year apprenticeship course to a three year course and that a new standards-based apprenticeship for bakers and confectioners was introduced.

1.4.1 FAS Bakery Apprenticeship Course

In 1997 the new pilot standards-based apprenticeship for bakers and confectioners was introduced. This was the first involvement with FAS and the NBS as in the past the bakery trade was not thought by FAS to be a designated trade. The course document (1997) stated that,

The curriculum will provide the core skills necessary to operate equipment and transform new raw materials in the process of bread and flour confectionery production, dough making, dividing, moulding, proving, cake making, depositing, baking and cooling, laminating, decorating including design etc. These skills so acquired will allow people to specialise in specific areas to meet the needs of the bakery/confectionery industry.

The programme involved a maximum of forty weeks at the NBS and the remainder of the time in on-the-job training and development of the necessary skills. Throughout the programme apprentices were assessed both practically and theoretically to establish their competence, monitor progress and identify areas requiring additional development. Finally on completion of the course students received a National Craft Qualification. As part of the FAS programme students were given the opportunity to travel to the German Baking Academy. It was envisaged that this initiative would promote experiential bakery education and learning for participating students. This initiative was to become an ongoing collaborative initiative for bakery education between Ireland and Germany. Through its involvement with the German Baking Academy the NBS collaborated with other European Bakery Education Institutes. One such initiative was known as the 20/21 programme. This programme promoted student and teacher exchanges throughout Europe. It was a major factor in promoting staff development in International bakery educational practices.

1.4.2 Continuous Professional Baking Courses

The FAS pilot programme was not repeated again in 2000 and consequently the most turbulent time for the NBS was the millennium year which challenged its very existence. This was the onset for the demise of the Diploma in Bakery Production and Management course along with the cessation of the Bakery Apprentice Programme. Worst of all there was no student intake. A crisis point had been reached it could have been the demise of the sole bakery training and education institute in Ireland. Mr. Derek O'Brien, Head of the NBS, along with colleagues, immediately devised an interim measure by expediently drafting, developing, validating and implementing short professional courses for mature students which were an immediate success. In October 2000 Professional Baking Bread and Professional Baking Cake was introduced which was followed in September 2001 with Professional Baking Sweet Breads and Professional Baking Pastries and Snacks in response to student demand. They were designed and structured to be exciting, interesting and hands-on. They were a resounding success with 136 students enrolling for the first semester in 2000. This demand is reflected in the number of participants currently attending part-time courses at the NBS. The table below illustrates the steady increase in student numbers.

Table 1: Increase in student numbers

1999/2000	2000/2001	2001/2002	2002/2003
0	136	206	398

Figures from Course Proposal Document (2003:36)

An article by Regan (Nov, 2006) in the Sunday Business Post captures the success of the part-time modularised courses at the NBS which was highlighted during an interview with the Head of the NBS. 'We don't advertise our courses any more'. O'Brien says. 'We have a waiting list now for next September already and when we go to September we normally have a waiting list of 600-700 people looking for 200-300 places'. With the introduction of the full-time course less places were available for part-time course. This concurs with the figures for the academic year 2005 / 2006 showing 25 full-time and 250 part-time students attending the NBS. (Figures from the Course Proposal Document 2006).

Those short courses were a resounding success because the student was introduced to such a wide array of products from the simple white pan to the more sophisticated varieties of bread such as German Weizenmischbrot or Italian Pagnotta, similarly with cakes, pastries and sweet breads. Those courses were introduced at a time when the economy was buoyant, there was

increased disposable income which enabled individuals to register on those courses. Course flexibility was a major advantage as the courses were time-tabled enabling students to combine work and learning or learning with leisure and relaxation. Foreign travel educated some people of ethnic, speciality breads and other baked products. On their return to Ireland they sought such products which were almost non-existent consequently they resorted to participating on the short courses. Farmers markets were a new phenomenon offering the consumer a range of home baked products, some students undertook the short professional courses so as to become entrepreneurs and producers for those markets.

The NBS currently offers the following Professional Baking Courses,

DT400P	Bread 1 (TFBK 1027)
DT400P	Bread 2 (TFBK 1026)
DT400P	Cake 1 (TFBK 1023)
DT400P	Cake 2 (TFBK 2024)
DT400P	Sweet Breads 1 (TFBK 2026)
DT400P	Sweet Breads 2 (TFBK 2025)
DT400P	Pastry 1 (TFBK 2028)
DT400P	Pastry 2 (TFBK 2023)
DT400P	Artisan Bread (TFBK 3023)

The part-time short professional baking modules are subject specific. Applications are invited from mature students. They are delivered in a systematic manner (course delivery is identical regardless of the teacher) with emphasis on student acquisition and retention of transferable skills. This is achieved by students completing each module at level one prior to progressing onto a successive module at level two. Experiential learning is exercised as students observe a demonstration prior to repeating and practising the same. Generally in each class students are given the opportunity to produce three products. Students on the modular courses are continuously assessed in practical skills so as to assess their level of proficiency in a range of transferable skills. Marks are allocated on hygiene and cleanliness, work method and competence and the final product. In the next chapter modularisation is dealt with in greater detail.

Those professional courses were introduced at a time when the bread market in Ireland was beginning to grow. Hart (1998, p. 33) in the Bakery World Trade Journal reported a slight increase in the Irish bread market, which was worth £220m in 1996. This growth was significant with the development of speciality breads. She reported that the growth of

speciality breads in Ireland at the time was fuelled by consumer demand. Furthermore, she stated 'Irish consumers tastes are becoming increasingly sophisticated and, as they take advantage of the booming Irish economy, Irish customers are beginning to spend their disposable income on more overseas travel, more eating out and more home entertaining than ever before', and she went on to say that Italian, Indian, and French breads are becoming the norm in some households.

A prediction was made by Swords in 2000 which proved to be prophetic: (2000, p.22) in the Bakery World Trade Journal titled, Baking for 2000,

Multiples are set to further sweep the country over the coming years and there is no doubt that this will have serious effects on the bakery industry. Twenty four-hour shopping and Sunday trading will represent the normal criteria for a successful business and most operations will either specialise or begin to produce on a larger scale in order to establish supplier relationships with the multiples. The consumer will be a more educated, discerning, and well-travelled person and it is predicted that ethnic niche areas will be the way forward for the small bakery. It is thought that quality accreditations will make a powerful and definite mark on the food industry and that the long awaited arrival of legislation on quality and hygiene matters from the EU will finally become a reality.

This statement proved to be accurate: there was increased travel and demand for ethnic breads which assisted in the immediate success of the part-time courses while the enforcement of Hazard Analysis Critical Control Point (HACCP) has regulated and implemented standardised quality and hygiene regulations. Her prediction provided encouragement at the time for the part-time Professional Baking Courses at the NBS. Furthermore, Ronan (2007, p. 63) as part of his masters thesis carried out research in the South East of the country. His findings acknowledge that the demand for pagnotta, ciabatta and pitta bread had increased with imported products satisfying the market.

Those Professional Baking Modules are currently offered as stand alone modules or taken as core modules in the BSc programme. As part of her BA degree in Education Ann Marie Dunne, lecturer, at the NBS in 2002 surveyed the students attending the Professional Baking short courses. The results indicated a broad student profile and an increased level of interest by these students in attending future courses both in full-time and part-time cited in the Higher Certificate in Baking and Pastry Arts Management Course Proposal Document (2003:35).

1.4.3 Higher Certificate in Baking and Pastry Arts Management Course

In 2003 student demand fuelled by changes in lifestyle, technology, demographics, and the needs of industry and society were the reasons cited in the programme document for the demand for a full-time Certificate in Baking & Pastry Arts Management Course. The aim of this programme is to educate students for careers in the bakery, hospitality, and food service industries leading to the possible attainment of managerial positions. This course was developed to be a two year full-time programme. It is delivered in a modular and semesterised structure which is in line with International trends. The course programme document states that it comprises of three core disciplines, namely:

- Baking and Pastry Arts Studies
- Science and Technology
- Business Management.

Baking and Pastry Arts Studies are designed to promote student confidence in the acquisition and retention of the skills and craftsmanship along with the underlying knowledge associated with that of a professional practitioner. During the two year course students complete the suite of Professional Bread, Cake, Pastry and Sweetbread modules.

The Science and Baking Technology Studies introduce the students to the scientific principles and processes applicable to all aspects of baking. The subjects offered in this category are Ingredient Studies, Baking Technology, Applied Science and Food Hygiene and Safety.

The Management and Business Studies subjects are designed to inform the student of the management principles of both commercial and non-commercial entrepreneurship of baking, pastry and the foodservice industries. Students are introduced to Computer Applications, Communications, Marketing, Business Administration, Accounting and Human Resource Management. Students participating on this programme can avail of the opportunity to take part in two continuous professional development courses: German Bread-making and German Cake-making at the German Baking Academy.

Programme strategies are inclusive of lectures, laboratories, case-studies, individual and team projects. Tutorials are featured as part of learning and teaching. Additionally, formative and summative methods of assessment are undertaken throughout the programme. A minimum pass mark of 40% is a requirement for student progression. In year one students undertake six

modules in each semester. On successful completion of each module students acquire five ECTS credits, this equates to a total of sixty ECTS credits. Similarly by the end of year two students accumulate a total of one hundred and twenty ECTS credits. Assessments and examinations on this programme are carried out under the Dublin Institute of Technology General Assessment Regulations. This programme was so successful that it was imperative to facilitate its progression to degree level. This meant that the certificate course was modified to become the BSc degree programme in Baking and Pastry Arts Management at level seven on the National Qualifications Framework (NQF). Meanwhile an exit award of Higher Certificate in Baking and Pastry Management exists for students who successfully complete year two of the degree programme. The modules covered on year one and two of the BSc programme have been derived from the Higher Certificate programme. Students apply through the CAO for admission onto the programme.

1.4.4 BSc in Baking and Pastry Arts Management Course 2006

The January 2006 BSc in Baking and Pastry Arts Management course proposal document maintains that there was a demand for a degree programme. This was evident by the number of school leavers seeking higher qualifications at degree level as a means of promoting their career paths. There was also a demand from holders of certificates and diplomas from the school for ongoing development and training. Demand for the BSc degree programme was also supported with a survey conducted with undergraduates. Furthermore consultations with graduates, bakery industry leaders, and academics revealed support for such a move. This, along with international bakery developments in International and National Universities and Academic Institutes signified the need for a degree programme.

As part of the Quality Assurance procedures of the DIT students in 2005 were surveyed to obtain feedback on their course of study (Form Q6) which indicated that 70% of the full-time bakery students were interested with pursuing their studies to a higher level. It was now imperative that progression for graduates be facilitated which is contingent with the ethos of the DIT.

The DIT mission statement specifies the duties and functions of the Institute.

The Dublin Institute of Technology is a comprehensive higher educational institution, fulfilling a national and international role in providing full-time and part-time educational programmes across the whole spectrum of higher education. It aims to achieve this in an innovative, responsive, caring and flexible learning environment. It is committed to providing access to students of all ages and back-grounds, and to achieving quality and excellence in all aspects of its work. This commitment extends to the provision of research, product development and consultancy services for industry and society while continuing to have regard to the technological, commercial, social and cultural needs of the community it serves.

Duff, Hegarty & Hussey (2000:107/8)

The aim of the BSc programme is to equip students with the skills and knowledge necessary for management careers in the bakery industry. Baking and Pastry Arts studies, Languages, Food Safety and Occupational Health, and Business, Communication and Entrepreneurial Studies feature strongly on this programme. The individual subjects include communications, professional baking bread, cake, sweetbread, pastry, legal studies, language studies, ingredient studies, baking technology, information technology, quality assurance management, baking science, human resource management, marketing, financial and cost accountancy, bakery operations management, baked foods product testing, enterprise development, functional baked foods and allergens, viennoiserie and konditorie, artisan bread technology, research methods, consumer behaviour, baked foods product development, and microbiology. The programme offers students the option of elective modules such as Language Studies, Food Entrepreneurship or Microbiology. The core bakery subjects are taught at the NBS while the remaining specialised modules on the course are provided by the School of Hospitality Management and Tourism within the faculty and the School of Retail and Services Management, part of the Faculty of Business.

Table 2 Outline of BSc in Baking and Pastry Arts Management Course

Subjects	Year 1	Year 2	Year 3
Business Studies	Management Principles Communication	Service Marketing Human Resource Management Financial and Cost Accounting	Bakery Operations Management Enterprise Development Consumer Behaviour
Baking and Pastry Arts Studies	Professional Baking Bread 1/2 Professional Baking Cake 1/2	Professional Baking Pastry 1/2 Professional Baking Sweetbread 1/2	Viennoserie Konditorie
Legal Studies	Quality Assurance	Legal Studies	International Legal Studies
Scientific Studies	Baking Science Hygiene and Safety	Gastronomy	Functional Foods and Allergens
IT Studies	Computer Applications	Computer Applications	
Teachnology Studies	Baking Technology Baking Ingredient Studies	Baking Technology Baking Ingredient Studies	Artisan Bread Technology Baking Technology
Research			Research Methods Baked Foods Testing Studies Baked Product Development
Language Studies		Language	Language
OPTIONS		Option A: Gastronomy 1 Language Choice 1 Option B: Legal Studies Language Choice 2	Option A: Food Entrepreneurship Language Choice 3 Option B: Introduction to Microbiology Language Choice 4
AWARD		Higher Certificate in Baking and Pastry Arts Management	BSc.Degree in Baking and Pastry Arts Management

The BSc modularised programme has brought bakery education into the twenty first century, as it has international appeal with modules on German Konditorie, which is classical German tortes and desserts or Viennoserie which is French laminated or non-laminated sweet dough products. Students have the option to elect a language with the choice of French, Spanish, Italian or German. The Functional Foods and Allergen module familiarises students with health issues, while the Product Development module concentrates on how to cater for them. The Research Methods module has enhanced the academic orientation of the programme with students becoming proficient as independent researchers and academic writers.

The programme is learner-centred while it promotes an academic, scholarly, and liberal approach to knowledge based skills. The degree programme places the NBS in a leadership position in Bakery Management education in Ireland by equipping students with a qualification which will promote entrepreneurial development in the bakery sector. It acknowledges the link between the technological, social, traditional and future needs of the bakery industry. The course duration is three years which is semesterised and modularised.

Learners are encouraged to engage in their learning by attending lectures and tutorials, discussions, debates, seminars, field trips, visiting lecturers, reflection and research. Assessments are conducted by formative and summative methods with similar to that of the higher certificate course. On completion of the programme students will accumulate one hundred and eighty ECTS credits. The programme operates in accordance with DIT Quality Assurance Procedures. Recommendations along with feedback is accepted from the external examiner and the students on the programme.

The BSc in Baking and Pastry Management programme has created a framework for bakery education along with developing a new learning paradigm in bakery practices. Future course developments will include distance learning by means of offering some modules electronically. The possibility of an honours degree is kept under review. A future possibility is the option of bridging modules which could facilitate a transfer to the Honours Degree in Food and Beverage Culinary Management or Bar Management.

1.5 Aim of the research

The aim of this research is to evaluate curriculum change at the NBS by exploring the factors which have impacted on curriculum change there from 1998-2008.

1.6 Objectives of the research

The objectives of this research was to explore if the following perspectives have impacted on curriculum change,

Biographical / Staff Professional Development

Cultural diversity and multi-ethnicity

Science

Technology

Socio-Historical

Structural / Economy, Social, Politics

Micro-politics (quality insurance/modularization/student profile/collaboration with Germany)

1.7 Research Questions

The research also attempted to answer the following questions,

- Q.1 Has technology and science impacted on curriculum practice?
- Q.2 Have consumer patterns impacted on curriculum design?
- Q.3 Has a culture change impacted on curriculum?
- Q.4 Has economic growth impacted on curriculum development?
- Q.5 Has there been a change in student profile?
- Q.6 Has National and European Legislation impacted on curriculum design?
eg. (Bologna Agreement 1999) and the DIT Act 1992.
- Q.7 Has staff professional development impacted on curriculum change at the
NBS?
- Q.8 Explain how DIT policy has influenced curriculum change
- Q.9 Has collaboration between the National Bakery School and the German Baking
Academy impacted on curriculum design?
- Q.10 Has modularisation impacted on curriculum change?

1.8 Outline of thesis chapters

In chapter one the research is introduced with a brief history of the NBS in order to provide a perspective on the level of curriculum change in the NBS from 1998-2008. The reasons for conducting the research will also be examined.

Chapter two presents the literature, which is reflective of curriculum, curriculum evolution and change primarily in the areas of technology and science, culture, biographical, structural, micro-political and socio-historical.

Chapter three outlines the research design which embodies a hermeneutic case study using qualitative methods involving a survey, interviews, and data analysis. Furthermore the literature on research design is documented and the main theories discussed.

Chapter four presents and summarises the research findings from the interviews conducted with lecturers and the survey which involved students who participated on the German bread making course.

Chapter five discusses the findings and attempts to compare the outcome with the initial research aim and objectives.

Chapter six gives an overview of the purpose of the research along with the findings and a brief discussion on whether or not the objectives of the research have been achieved.

CHAPTER TWO

Literature Review

2.1 Introduction

In the previous chapter it has been acknowledged that in the last decade the NBS has undergone significant curriculum change. This has proven that curriculum is vibrant and not static Hewitt (2006, p. 39). As already outlined the aim of this research was to evaluate curriculum change at the NBS by exploring the factors which have impacted on curriculum change there from 1998-2008. This chapter presents aspects of the literature which is related to curriculum, curriculum evolution and the factors which have brought about change.

2.2 Curriculum.

The word curriculum is derived from the Latin word, *currere* referring to the running of a course as in a chariot race probably of Greek origin. In the same way as a school curriculum can be described as “a course of study” (Hewitt, 2006, p. 24). According to Wiles & Bondi, (2007, p. 18) the study of curriculum theory is nearly one hundred years old. Two influential curriculum theorists were John Dewey who published in 1902 *The Child and the Curriculum* and Tyler with his publication of *Basic Principles of Curriculum and Instruction* published in 1949. Their work contributed to the academic nature of curriculum. Tyler believed that curriculum development was a linear process which commences with clear objectives and derives at a measurable conclusion. His work gave curriculum a new meaning and prompted the search for additional ways to study curriculum and create new knowledge.

Curriculum has multi meanings, which is reflective of the numerous definitions available thus creating an overwhelming level of ambiguity. ‘There are almost as many definitions of curriculum as there are writers, and we do not claim that any one definition is correct’ according to (Posner & Rudnitsky, 2001, p. 6).

Some of those definitions are as follows, curriculum is defined by (Kerr, 1968, p. 16) cited in (Kelly, 1999, p. 6) as ‘all the learning which is planned and guided by the school, whether it is carried on in groups or individually, inside or outside the school’. Interestingly Neagley and Evans propose that the curriculum process is ‘all of the planned experiences provided by the school to assist pupils in attaining the designated learning outcomes to the best of their abilities’ (Child, 1997, p. 433). The definition of curriculum according to Jenkins and Shipman (1976) in (Barlett, Burton & Peim, 2004, p. 72) is that:

A curriculum is the formation and implementation of an educational proposal to be taught and learned within the school or other institution and for which that institution accepts responsibility at three levels: its rationale, its actual implementation and its effects.

Meanwhile Lawrence Stenhouse (1975, p. 53) in (Barlett et al., 2004, p. 72) defined curriculum differently stating that it is:

An attempt to communicate the essential principles and features of an educational proposal in such a form that it is open to critical scrutiny and capable of effective translation into practice.

Ralph Tyler is considered a very influential curriculum theorist best known for devising the “Tyler Rationale”. He set about structuring curriculum rather than defining it. Tyler (1949) cited in (Kelly, 1999, p. 14) argues that there are four elements to curriculum construction and planning which are objectives, course content or subject matter, methods or procedures and evaluation, this is similarly reinforced by (Child, 1997, p. 433). Posner (2004, p. 16) states that educators have turned to Tyler’s Rationale to answer procedural questions of curriculum. Tyler suggests that there are four questions which need to be answered when developing any curriculum which are,

- (a) What educational purposes should the school seek to attain?
- (b) What educational experiences can be provided that are likely to attain these purposes?
- (c) How can these educational experiences be effectively organised?
- (d) How can we determine whether these purposes are being attained?

To evaluate curriculum one can consider that there are four elements to it which are the planning, content, pedagogy and assessment. Curriculum planning at the NBS involves following the DIT guidelines on Quality Assurance Procedures. Curriculum requires careful planning, it is a hierarchical process that is labour intensive, tedious and bureaucratic. It is initiated by a Course Planning Committee and supported by the Advisory Committee. Consequently the Validating Panel evaluate course proposals prior to seeking approval from the Academic Quality Assurance Committee. The subject of Quality Assurance within the DIT is dealt with in greater detail later in this chapter.

Wiles & Bondi (2007, p. 18) argue that the foundation or planning for educational curriculum is influenced by five dominant factors. Those factors are, the social forces in society, treatment of knowledge, human growth and development, learning as a process and

technology. Meanwhile Beane, Toepfer, and Alessi (1986, p. 108) note that sociology presents a challenging and exciting field for curriculum planners. They maintain that attention must be paid to such issues as technology, family structure, work, lifestyle, and other aspects of society.

Curriculum is concerned with the knowledge to be transmitted. The course syllabus typifies the topics that are relevant to an entire course. The NBS was established with the intention of delivering technical training. The following gives an indication of the intended objectives of curriculum design at the NBS. O'Dowd (1985, p. 11) argues that,

What is exceptional in the case of the Bakery School is that as an institution it was intended to be solely technical in its curriculum. At the same time the technical curriculum of the Bakery School was intended to be broad in that it included the principles of physics and chemistry and simple costings as well as the practical aspects of breadmaking and confectionery. Taken with the strict rules of dress, demanded by the Bakers' Union (such as attendance at class and passing of examinations) it is clear that the development of the Bakery School was conceived as part of the traditional process of apprenticeship which involved much more than technical training: it also involved initiation by a master into the moral norms of the craft, the teaching of responsible attitudes towards the client and the brotherhood of the craft.

Another part of curriculum development is knowing and learning or pedagogy. Jerome Bruner's work on curriculum is symbolic of Lev Vygotsky whose work has had a profound influence in the field of education and curriculum Scott (2008, p. 11). Vygotsky and Bruner are considered to be two influential figures on the subject of teaching and learning. Scott (2008, p. 11) claims that Vygotsky's work in the field of curriculum and generally in the area of education has been profound. He is associated with devising the zone of proximal development and inner speech. They saw culture and society as key dimensions to learning. However a number of different models of pedagogy have been developed including imitation.

Social learning theory combines both elements of behaviourist and cognitivist orientations which impels that individuals learn by observation. This is reflective of student acquisition of skills for those participating on practical modules at the NBS. Imitation presupposes practice and this is the acquisition of a skill. Students observe a demonstration; the purpose of the demonstration is to give the students a visual concept of the skill. It helps assist the student to understand the correct method and standards to be achieved in a given task. Learning a skill involves three stages which are the cognitive, psychomotor, and affective. The teacher is a participator in practical professional baking classes while the students switch from being passive to active learners. Active learning is associated with the acquisition of a skill, the only way to master a skill is to learn by imitation and trial and error.

Robert Gagn  contributed to curriculum design and instructional design. He saw the teacher as an enforcer of learning with the responsibility to impart knowledge to students. He placed great emphasis on a learning hierarchy believing that individuals learn by commencing at the simplest and moving to the more complex levels for learning to be successful.

Learning hierarchies are the best way to describe the ‘structure’ of any topic, course, or discipline. They describe the intellectual operations within that subject-to learn about it, to think about it, to solve problems in it.

Gagn  (1970, p. 245) in (Posner, 2004, p. 172)

Curriculum represents a set of intended learning outcomes which are assessed by various methods. Formative and summative methods of assessment are practiced at the NBS.

2.3 Curriculum Change

In 1859 Charles Darwin published *The Origin of Species*, According to Hewitt (2006, p.24) this publication and the two that followed it presented and defended his theory of evolution. His work has influenced thinking and given an impetus to curriculum evolution. According to (Posner & Rudinsky, 2001, p. 10) ‘A course design evolves as a series of successive approximations. In fact, course designs are never really completed. Rather, we abandon further planning for the time being’. This statement is certainly reflective of curriculum design at the NBS during the last decade. This is reinforced further by Laurriand (1993) cited in (Ashwin, 2006, p. 84) with the following statement,

For the educational innovator, who seriously wishes to improve the quality of education and the learning experience, it is imperative that we create an educational system that is clear about its values and sets its aims and ambitions high, and that is capable of rapid adaptation to its technological, as well as its social, cultural, and political environment.

Fullan (1982) contends that curriculum change is not a single entity, but is multidimensional. He identifies three dimensions of change which are the use of, new materials, the use of new teaching approaches, and the alteration of beliefs such as pedagogical assumptions and underlying theories Blenkin, Edwards and Kelly (1992, p. 31). According to them there are others who argue that the concept of curriculum change can embody the notion of innovation, development, renewal, reform, improvement, precision, and qualitative meaning. They endorse that there are many recent and emergent theoretical perspectives regarding curriculum change. They state that House (1979, 1981) identifies three perspectives namely the technical, cultural and political. Meanwhile Olson and Eaton (1987) identify three conceptions of change which include the systems approach, the ecological and the reflective,

while Adams, Cornbleth and Plank (1988) identify three similar models the technicist, the political and the consensual in relation to state reform in the USA.

Interesting Blenkin, Edwards and Kelly (1992) find it difficult to find a single typology that encapsulates this phenomenon but argue that the following perspectives are representative of educational change which include the technological, cultural, structural, micro-political, biographical, and socio-historical. It is within this framework, inclusive of the scientific perspective that the literature research has been conducted in relation to curriculum change at the NBS as they present specific perspectives worth investigating. Furthermore on close inspection of course programme documents there is a correlation with the authors' perspectives and that presented in the documents. However, it is apparent from course programme documents and the literature search that science has impacted on curriculum change at the NBS. In this study each perspective is examined separately so as to establish its impact on curriculum change at the School.

To comprehend curriculum change at the NBS in the last decade it is imperative to assess the implications of individual perspectives on curriculum there. Those perspectives are based on the Blenkin model and encompass the following in relation to this study,

- | | |
|-----------------------------|--|
| • Biographical | Staff Professional Development |
| • Cultural | Travel, Multi-nationalism, Immigration |
| • Micropolitical | Local Level Decisions and Policies |
| • Socio historical | Historical Evolution |
| • Structural | Economy / Social / Political Influences |
| • Technological and Science | Modern Technology / Scientific break-throughs. |

2.4 Biographical Perspective

The biographical perspective focuses on the adaptation of practitioners to change. For the purpose of this research this perspective concentrates on the impact of continuous professional development on curriculum change within The Bakery School. Blenkin et al. (1992) state that 'It is now widely recognized that the success of curriculum innovation, whether internally or externally initiated, is contingent upon the professional development of teachers'. This philosophy is reiterated by Flynn, Industrial Correspondent (2003) in an article in the Irish Independent 14th October 2003 documenting the achievements and continual professional development of staff at the NBS and indeed their source of inspiration to the British Confectioners' Association.

Staff development both academically and in skills training has been evident over the years with work colleagues involved in ongoing professional programme development. The National Baking Team is made up of professional baking experts who teach at the NBS. This is a partnership between the NBS and the Richemond Club Ireland. They have competed successfully as members of the Irish National Baking Team at International level since 2001 at various venues, accomplishing various degrees of success. The following is an overview of their achievements and success,

2001	Paris, France	8 TH
2002	Boule, Switzerland	7 TH
2003	Nantes, France	3 RD
2004	Herning, Denmark	2 ND
2005	Nantes, France	3 RD
2006	Munich, Germany.	1 ST

Their biggest achievement was gaining first place in Germany in 2006 proving that they are better and more proficient than the German Baking Team. Consequently staff at the NBS have become renowned world wide for their expertise and skill. Some staff members were invited by Moulin Foricher, Paris, and Les Artisans Boulangers to partake in “La Fete du Pain 2007” in La Ville de Soissons. Consequently this was an opportunity to showcase Irish craftsmanship at its best.

The introduction of the Viennoserie, Konditorie and the Artisan Bread Technology Module in year three of the BSc programme have a direct link with staff professional development. Staff competing at international level acquired international bakery skills and education. This influence brought about the inception of those modules. Subsequently this level of success has impacted on course content enabling students to accomplish and develop international bakery skills and practices. Hayden (2006) in the Sunday Business Post 23rd April 2006 acknowledges the diverse range of international breads practised on the advanced bread making course at the NBS. This is a reflection of the advancement of the teaching and technical staff along with their enthusiasm for the subject.

The module on Food Allergens and Functional Foods in year three of the BSc programme was inspired by a member of staff who had a keen interest in the subject. It was her insight and keen interest in this subject which was the fruition for this subject. Food anxiety is becoming a concern for consumers hence the need for students to be knowledgeable about food allergens and intolerants. This module introduces students to the effects and

consequences of food intolerances for Food Allergy sufferers. It portrays the benefits of functional foods and ingredients such as pro-biotic, folic acid, omega 3, fortified foods and so on in the production of food within the bakery and food sector.

Currently there are nine employees based at the NBS in Kevin St. Three members of staff there are undertaking studies at Masters Level, one has just completed a BA and another colleague has recently been awarded an Honours Degree in Food Science. Others are immersing themselves in skills training at international level. This is indeed an indication of their enthusiasm towards the Performance Management & Development System of the DIT. It has been proven that continuous staff professional development within the NBS has contributed to course content and syllabus development.

It is worth noting that a change in curriculum practice can bring with it problems, In recent years greater attention has been given to teacher stress, and according to Lauer and Lauer (1976) cited in Blenkin et al. (1992) ‘the main cause of stress is not change *per se* but the rate and kind of change’, subsequently it is recommended by the author that teachers are given greater control over the pace and direction of change. Fortunately Staff at the NBS have not experienced this phenomenon but have embraced change with them displaying an exuberance that has transcended throughout the transitional period of change.

The previous chapter clearly indicates that there has been a major shift in curriculum practice at the NBS which transformed the syllabus, course delivery, and the learning outcomes. Despite this a very smooth transition has been maintained, minimising staff stress and burn-out. Modularisation has brought about a very considerable increase in workload in teaching as has a change in the student profile. Technology has been embraced by staff with everyone proficient in the use of personal computers for improved teaching systematic approach methods and communication. Staff at the NBS are currently involved in research, consultancy and product development. They have links with other Academic Institutes worldwide and have Membership of Professional Bodies some of which are:

Richemont Club-Ireland	Institute of Irish Bakers
British Baking Society	Bread Bakers Guild of America
Retail Bakers Association	Institute of Science and Technology
Royal Institute of Public Health.	

2.4.1 Euro 20/21

As part of the 20/21 initiative the NBS has organised student and teacher exchange with its partnership centres of excellence as follows,

- Bundesfachschule des Deutschen Backerhandwerks, Germany
- Bakkerji School, Wageningen, Netherlands
- Htl Lebensmitteltechnologie- Getreidewirtschaft, Wels, Austria
- Brood en Banketbakkerijschool, Brugge, Belgium
- College of Technology, Pardubice, Czech Republic
- American Institute of Baking, Manhattan, Kansas, USA
- National Bakery School, University of South Bank, London, UK.

The NBS is held in very high esteem as mentioned earlier Whitley (2006, p. 5) quotes Derek O'Brien in his book *Bread Matters* this is indeed a very high accolade. Furthermore the NBS has promoted its public profile by exploiting the media in its recruitment of students and promotion of the part-time courses particularly in the print media Hayden 23rd April 2006 in the Sunday Business Post. Interestingly update@ dit website (2007) states that,

Derek O'Brien and his colleagues in the National Bakery School have been on the media offensive over the last week to promote the BSc in Baking and Pastry Arts Management. So far they have appeared on RTE Radio One, on Tallaght 99fm and in the Irish Independent. Having campaigned for many years for 'real bread', Derek's campaign has paid off with journalists in thrall to the smell of real bread baking and to the delight of the chocolate muffins Ann Marie brought into the studio.

Winter Food on RTE Radio 1 (21/Jan/2007) featured bread and bread making. The programme featured Clodagh McKenna interviewing staff and students from the NBS on this subject. This was in conjunction with Derek O'Brien championing the cause of good bread and the promotion of courses at the NBS. Finally staff and students at the Bakery School displayed their professionalism in baking when they featured on an RTE programme Capital D which was televised on 22/12/08. Second level students have such an array of Third Level Institutes and courses to choose from that it is imperative for the NBS to promote its courses so as to attract students and remind employers of possible future recruitments.

2.5 Cultural Perspective

There is a lot of ambiguity concerning the cultural perspective especially in education. Blenkin et al. (1992, p. 44) state that, 'The term culture is notoriously difficult to define, especially when applied to education'. This statement is subsequently reinforced by Barnett and Coate (2005, p. 32) 'The term culture can be ambiguous'. In relation to this research the

term “culture” looks at the implication that ethnicity, immigration, tradition and travel have had on bakery education and training. (Ingram & Shapter, 2006, p. 19) state that 'bread is a particularly fundamental aspect of a country's cuisine, it reflects the climate and geography as well as the customs, culture and religious beliefs of the people'. Ireland has a proud tradition in baking with its soda breads, boxty, barm brack, porter/whiskey cake. Irish wheat is ideal for all types of chemically aerated products especially soda breads, which are unique to our island. The NBS places a strong emphasis on traditional Irish products using home produced ingredients as well as diversifying and incorporating international products.

2.5.1 Immigration

The influx of immigrants to Ireland is not a recent phenomenon but has had an influence on curriculum at the NBS. However, it is in recent years that Ireland has experienced a major cultural change with many nationalities settling here notably eastern European. In 2007 non-nationals accounted for 13% of the Republic of Ireland's population. This is reflected in the increase in the number of overseas students. Figures from the CSO show that there has been an increase in International students enrolled in third level courses which are aided by the Department of Education and Science. In the academic year 2000-2001 there were 117,475 full-time students enrolled in third level courses of which 8,820 were non-nationals. By the academic year 2004-2005 those figures had increased to 130,657 full-time students of which 12,889 were non-nationals. Meanwhile it is pertinent to recall the significance of other cultures that have impacted on bakery training and education. Historically the bakery industry has been influenced by the Jewish, Huguenots, and the Quaker communities in Ireland.

2.5.2 Jewish Community in Ireland

Harris (2002, p. 10) states that the Jewish community settled around the South Circular area of Dublin in the 1930's. With them came the onset of Jewish bakeries and the conveyance of their skills in producing ethnic kosher breads. Today the last remaining Jewish artisan bakery is the 'Bretzel' located at Lennox Street, Dublin 8, which is in existence since 1870. It still maintains a strong association with the NBS, recently they were involved in the establishment of the Artisan Bakers of Ireland. Another Jewish influence at the NBS was Robert (Ben) Briscoe, Lord Mayor of Dublin in 1956. Annually he presented the Briscoe Shield to bakery apprentice students for their outstanding level of achievement. The Jewish influence is still practised with students learning to make various Jewish kosher breads including challa, plaited and bagels.

2.5.3 *The Quaker Community in Ireland*

The Society of Friends, also known as Quakers, was founded at the time of the English revolution in the seventeenth century by George Fox (1624-1691). The well known biscuit making Jacob family fled from England to Ireland in 1674/75 to escape religious persecution. The Quaker community remained a tiny sect and never reached beyond one per cent of the population in England or Ireland. However they survived and prospered becoming very astute business people in manufacturing and banking. They were also renowned for their humanitarian work during the great famine 1845-1847. 'Quakers were attracted to baking as it provided a basic, wholesome food – the very staff of life' (O'Maitiū, 2001, p. 7).

The Quaker community in Ireland have been associated with the food industry such as Bewley's Bakeries, Cadbury, Fry and Rowntree Chocolate, Lamb's Jam, and Jacob's Biscuits just to name a few. However, it is Bewley's bakeries that has had an impact on the NBS. Murdoch (2002) describes how Joshua Bewley started business at Sycamore Alley just off Dame Street in the early 1840's specialising in coffee. Meanwhile it wasn't until the late 1890's that they were associated with baked products. Bewley's could be described as having set an early precedence within the bakery trade for quality and standards. Swift (1991, p. 27) describes Bewley's as specialising in 'high-class confectionery', while acknowledging an advantage of working there was the firm's 'co-operative attitude to local union representatives discharging their duties'. Interestingly Jonathan Swift the founder of the NBS was a former employee of Bewley's which is publicised in the Journal of the Irish Labour History Society 'Saothar 15' (1990, p. 8), which states that his wartime 'conscientious objection' was an apparent advantage in the eyes of a Quaker employer. Furthermore, prior to the cessation of the apprenticeship course bakery apprentices from Bewley's received formal bakery education at the NBS. This is an incitement towards their standards of excellence practiced at the NBS.

2.5.4 *Huguenot Community*

Another group who settled in Ireland around 1685 were the French Huguenots who were persecuted, exiled Protestants. Protestant Reformation was felt throughout Europe in the 16th century with the two main protagonists being Martin Luther in Germany and Jean Calvin in France. The Huguenots under Calvinism had most of their priviledges removed and began to emigrate. Some of them settled in the south of Ireland notably Waterford where the Cromwellian army in 1650 had expelled many of the rich Catholic merchants who were based there since the Anglo-Norman invasion. The defeat of the Catholic James II at the Battle of the Boyne in 1690 with William of Orange gave the protestant population notably Waterford a stronghold. Some of them were bakers and they became associated with the Waterford Blaa,

the word which is possibly derived from blanc (white) or blē (wheat) in French. This bread is unique to that area. O'Brien (2008) in an unpublished paper states that the authentic blaa is made using the natural fermentation process and is usually oval in shape and dusted with flour. This product is produced by students on the first module of the professional bread making course at the NBS. It is synonymous with Barron's Bakery in Cappoquin, Co. Waterford which featured on an RTE One programme, Corrigan Knows Food (2007).

2.5.5 *Multi-Culturalism and Multi-Denominationalism*

Ireland has become an increasingly multi-cultural and multi-denominational country with many nationalities residing here. Figures from the Central Statistics Office show that 13% are non-nationals. Furthermore statistics released from the Department of Education show an increase in the number of foreign students in full-time third level education. Subsequently there is a greater demand for ethnic products for example Turkish Pitta bread, Indian Naan , German Rye, Italian Ciabatta/ Pizza /Pagnotta and French Baguettes, Californian Sour-dough just to name a few. Regan (2006) in an article in the Sunday Business Post states that those who do not want to bake bread are becoming more selective about where they buy it. Organic bakers she claims are seeing an increase in sales associated with the number of eastern Europeans who have moved to Ireland. The Polish are representative of this trend in seeking good quality breads by rejecting mass produced chemically induced alternatives, and already have opened a bakery in Cookstown in Dublin with a retail shop in Capel Street, Dublin 1. Another Polish Bakery has opened in Longford. A Russian Bakery 'Kazak' has opened at Granby Place, Dublin 1. Their opulence is in specialised sour-dough breads, significant with eastern European trends and tastes emerging in Ireland. Ethnic entrepreneurship has increased in Ireland with the number of eastern European and international retail outlets opening here to cater for the influx of workers particularly from central European, O'Connell in an article 2nd March 2008 in 'The Sunday Times' states that according to the most recent census, 420,000 foreigners live in Ireland of which almost half are Polish. Beane et al. (1986, p. 97) highlight cultural diversity in the educational system in the USA and raises questions in relation to curriculum planning. Just as cultural diversity in the past has influenced curriculum at the NBS so too will it impact on the future curriculum. As already signified there has been a change in student profile and practical subjects have an international influence.

Foreign travel has educated the palate thus ensuring consumers are more diverse in their preference for fine food, from the year 2000 to 2005 figures from Mintel show a 65% increase in the number of visits by individuals from Ireland to Europe. Failte Ireland announced that Ireland welcomed 7.8 million visitors in 2007. The NBS, in keeping with this trend, now

offers modules in Artisan Bread Technology, French Viennoiserie and German Konditorie to students studying on the BSc programme. This is an indictment of the NBS's dedication to cultural needs and advancement in product development. Bakery students attending part-time and full -time courses at the NBS are very fortunate to be afforded the opportunity to learn and deepen their skills in the German Art of Baking by attending short bread making and cake making courses at the German Baking Academy. Furthermore this opportunity promotes language development for full -time students who study German as an elective subject.

2.6 Micro-Political Perspective

According to Blenkin et al. (1992) the micro-political perspective focuses on how power is exercised and the innovators for change. In relation to the NBS this perspective examines the procedures and influences responsible for curriculum change at local level or within the DIT. The Governing Body of the DIT reviewed its general aims and goals and in 1994 adapted the following as its Mission Statement derived from the Act,

The Dublin Institute of Technology is a comprehensive higher educational institution, fulfilling a national and international role in providing full-time and part-time programmes across the whole spectrum of higher education. It aims to achieve this in an innovative, responsive, caring and flexible learning environment. It is committed to providing access to students of all ages and backgrounds, and to achieving quality and excellence in all aspects of its work. This commitment extends to the provision of teaching, research, product development and consultancy services for industry and society, while continuing to have regard to the technological, commercial, social and cultural needs of the community it serves.

Course Quality Assurance Handbook 2nd edition (1997)

To date the most influential micro-political perspectives for change at the NBS are quality assurance, modularisation, collaboration with Germany and a change in student profile.

2.6.1 Quality Assurance

The most significant micro-political perspective for the NBS is the compliance with the DIT Quality Assurance Procedures. In the last decade the school has implemented curriculum change which involved course committee members instigating change, writing new module descriptors and then having them validated and accredited. The authors of Academic Quality Assurance in Irish Higher Education (2000, p. 54) contend that it was on the Green Paper on Education 1992 that the terminology of quality assurance probably entered the public domain on education in Ireland.

The White Paper on Education 1995 highlighted the benefits of quality assurance in Higher Education in Ireland. It was envisaged that it would promote public accountability, benefit

students, economy and society. The academic quality assurance procedures within the DIT emerged as a prerequisite to the Institute being granted degree awarding power. This occurred when the DIT bill was being processed by the Oireachtas. The Academic Quality Assurance Committee of the Academic Council first printed the Quality Assurance Handbook in 1995 with a second edition in 1997 and subsequently revised in (2004). This is recorded in minutes of the 108th meeting of the Academic Council held 13/10/04. It is the official Academic Quality Assurance reference document.

According to Duff et al. (2000) quality assurance is a process through which higher education institutes guarantees to itself and its stakeholders that its teaching, learning, and other services consistently reach a standard of excellence. Duff et al. (2000, p. 163) argue that the Academic Council within the DIT which was established in 1970 has developed and implemented academic quality assurance. The Academic Council is the governing body responsible for course development and validation, examination procedures, and research promotion just to mention a few. The Academic Council formed Boards of Studies and Course Review Boards to examine the standards of proposed new courses and the operation of existing courses. With significant curriculum change at the NBS has become synonymous with the process of course validation and accreditation. The documentation required for submission by the course committee at the NBS to the Boards of Studies and Course Review Boards for initial course validation and course review is as follows,

- a) Details about the background to the course, the need and the demand for it, competing courses in Ireland and elsewhere.
- b) Resource and equipment requirements (library, computer, laboratory etc.)
- c) Course philosophy, aims and objectives.
- d) Admission and entry standards of students, arrangement for student transfer from other courses, non-standard entrants, access courses, and student numbers
- e) Course curriculum and structure, contact hours, teaching methods, tutoring arrangements, project work and assignments, other teaching and learning measures.
- f) Course content, syllabuses, arrangements for supervised work experience, field trips, synthesis of theoretical and practical elements.
- g) Marks and standards, methods of student assessment, examinations and progression requirements.
- h) Membership of course committees.
- i) Staffing details, including CVs, support staff.
- j) Facilities available and required.
- k) Professional recognition.

Duff et al. (2000) state that in addition to course validation and review procedures and as part of the quality assurance procedure, Academic Council and the DIT colleges annually appoint external examiners generally for a three year appointment. This is to ensure that standards achieved by students are satisfactory, as judged by their performance in examinations or other forms of assessment. The external examiner submits an annual report to the college on the examinations and the level of achievement of the students. The external examiner is empowered to make recommendations for modifications to draft examination papers including marking and assessment schemes this is evident in the external examiners report from Johnson and Wales University to the Director of Faculty (2005). The influence of Quality Assurance on curriculum design at the NBS has standardised practices and procedures.

2.6.2 *Modularisation*

The Bologna Agreement (1999) promotes modularisation and student mobility within the European Union by introducing a credit system with ECTS which is inclusive of life-long learning, the attainment of a degree after a three year cycle furthered with a masters and or doctorate degrees. This agreement is fundamental to academic excellence by comparability to standards and awards within the member states. In 2003 the steering committee favoured to introduce the full-time Certificate in Baking & Pastry Technology and Management course and in 2006 BSc in Baking and Pastry Arts Management on a modularised and semesterised basis. This was to broaden its appeal to mature, non-standard, advanced entry and part-time students particularly graduates of the part-time Professional Baking Courses. It was envisaged that modularisation would facilitate student transfer to diploma / degree courses and would be in line with International standards .

The Higher Certificate Course Programme Document (2003) states that:

The new course would be modularised along the lines recommended by the subcommittee on modular course structure in their report to Academic Council (December 2001) in readiness to proceed as and when the opportunity arises.

It was envisaged that modularity would develop the student's role in managing their learning and becoming more effective learners since the curriculum has been divided into what Henry Mackintosh describes as 'manageable chunks' Mackintosh (1992) in Jenkins and Walker (1994, p. 46). This is reflective of the way individuals tend to learn while demystifying the assessment process. (Moon, 1988, p. 8) describes a module as a unit or credit. 'In general terms the word module – or unit or credit – describes a unit of teaching activity and learning

expressed as an approximate number of hours of study'. Moon (1988) depicts that an essential part of module planning is to establish what core modules are to be taken by all and the elective modules which give students flexibility and choice. Modularisation promotes student autonomy by students taking control of their learning, setting goals and taking responsibility for their achievements. According to (Jenkins & Walker, 1994, p. 44) it is generally accepted that a module should be defined as 'a short unit of learning which could be linked to other modules to form a coherent programme', and that each module should:

1. Have explicit aims.
2. Must specify content including the requirement of prior knowledge.
3. Refer to appropriate teaching and learning styles.
4. Explain the methods of assessment.

The modular programme is designed to promote skills enhancement, student capability and employability. The modularised structure for the Higher Certificate Course enables students to acquire ECTS credits (European Credit Transfer System) enabling students to attain approximately 5 ECTS credits equating to 100 hours student effort. Notably level 1 modules do not have prerequisites while level 2 modules have prerequisites and co-requisites to facilitate part-time students. Students applying for Higher Certificate and Degree courses at the NBS do so through the Central Application Office (CAO) which came into operation in 1997 Duff et al. (2000, p. 52) while students applying for part-time modularised courses apply to directly to the NBS.

Jenkins and Walker (1994, p. 39) argue that:

A modular system is by nature dynamic, continually rebalancing its elements, adding, jettisoning, repositioning, as new areas of knowledge and new external agendas come to play. Yet curriculum change, modular or otherwise, is by nature incremental-the original ground plan and early foundations act as (often recognised) design constraints on later architects; new parts are added-extension, annexes, bridges-each with its own rationale, well designed in itself, each contributing to an increasingly complicated structure.

This statement emphasises the complexities associated with the modularisation programme at the NBS. This coincided with the demand for student advancement which led to the introduction of the Higher Certificate and BSc in Baking and Pastry Arts Management Course in 2003 and 2007. Students applying for Higher Certificate and Degree courses at the NBS do so through the Central Application Office (CAO) which came into operation in 1997. It is worth noting that full-time students in Institutes of Technology increased from 43,476 1998/99 to 51,507 in 2002/03.

The benefits of modularisation are presented on the DIT website:

1. Student recruitment.
2. Student choice.
3. Taking account of APL/APEL and work-based learning.
4. Common procedures throughout the institute.
5. Uniform student academic record.
6. Rapid new programme development.
7. Simpler system of introducing new modules.
8. Mixed mode – less distinction as between full-time and part-time.
9. Flexible delivery.
10. Synergy – will enable Institute-wide initiatives.

Moon (1998) asserts that modularisation increases the level of assessment and teacher administration, it can diminish teacher-student rapport as the delivery of modules has limiting time constraints. (Barnett & Coate, 2005, p. 88) argue that ‘The move to modularisation has been viewed by many academics as an administrative decision rather than one that meets epistemological concerns about the acquisition of knowledge’. They are aware that students can manage their courses in such a way so as to avoid some major topics. To overcome this Moon (1988) argues that an essential part of module planning is to establish what core modules are to be taken by all and the elective modules which give students flexibility and choice. Modularisation offers students choice and flexibility. Students participating on the whole time BSc programme have options and can elect modules to suit themselves as table 2 page 13 demonstrates.

2.6.3 Student Profile

Modularisation has brought about a change in student profile which is reflective of the number of part-time students and the number of part-time modules afforded to students. It is the part-time Professional Baking courses rather than the BSc degree programme which has seen a significant change in student profile. The most significant change in student profile has been reflected in student maturity and nationality. There is no major variance between the number of male and female students enrolling for full and part-time courses. Understandably due to its proximity there are more students from Dublin and its suburbs attending part-time courses than elsewhere in Ireland.

Figures from the Department of Education show that the number of part-time students in third level increased from 27,764 in 1998/99 to 34,509 in 2004/2005. Courses are time-tabled on a flexible basis enabling individuals with family and work commitments to undertake further

learning. Just as the NBS offers modules with an International influence so too there has been an increase in the number of International students studying there. Recently the cost per module has risen significantly. Fortunately this spiralling trend has not deterred the enrolment of mature students, perhaps this is reflective of their affluence and desire to learn.

2.6.4 Collaboration with Germany

As part of the modularised bakery/confectionery course at the NBS in 1997 it was proposed that bakery apprentice students would benefit from a European Experiential Learning Programme, the possibility of partnership with Holland, Germany, and Switzerland was explored. A decision to collaborate with the German Baking Academy in Weinheim Germany (Akademie Deutsches Backerhandwerk) was agreed as this institute is renowned worldwide for its standards and excellence in bakery education. The following quotation supports the level of esteem in which German Baking is held.

There are 250 bakeries in Ireland,” O’Brien says. “France has 60 million people and 30,000 bakeries. The breads in France and Germany are fabulously flavoursome, Germany is the bread heaven of the world.
Regan 12th November 2006, The Sunday Business Post.

It was envisaged that this collaborative partnership with Germany would enable students to,

- 1) Learn new bakery skills
- 2) Acquire new information
- 3) Develop language skills
- 4) Immerse themselves in a new culture
- 5) Promote staff development through student participation.

Flynn (2003) in the ‘Irish Independent’ contends that the German influence has had an impact on staff professional development at the NBS with staff representing and securing a bronze medal in the Coupe d’Europe, described by him as the ‘Oscars of authentic craft breads’. German breads made from sour-dough have now become an integral part of bread making for full and part-time students. Rye bread is made from sour-dough which is very popular in Germany. Rye dough needs to be soured in an acidic atmosphere using wild yeast *Candida Milleri* or *Saccharomyces Exiguus* as opposed to the normal *Saccharomyces Cerevisiae* because rye has a high diastatic activity or ability to convert starch into available sugars. This is achieved by making a pre-dough with water and rye flour while allowing the wild yeast and the lactobacilli bacteria naturally present in the flour to sour it to a low pH of 3.5 to 2.4. Once a starter dough is made it is left for a day and is then ready for bread-making.

Generally the rye bread contains 25% starter and the rest comprises of water and flour. Some of the remaining starter dough is 'fed' water and flour daily and is ready for the next dough.

Fortunately collaboration with the German Baking Academy has been strengthened and maintained with staff and students travelling there annually to further their skills and knowledge. Currently two specialist programmes in German bread and cake are delivered there under the supervision of the NBS, these courses are designed for students aspiring to study and experience continental baking. It is a pre-requisite that students must complete the TFBK 1026/7 Professional Baking Bread and TFBK 1023/4 Professional Baking Cake courses before undertaking any German course. The German Baking Academy offers other specialised courses in chocolate and pastry making for interested parties. Scally (2008) in an article in 'The Irish Times' titled *Let them eat bread* sums up the success of the German Baking Industry, they have over three hundred varieties of bread, with the average German consuming 90kg annually. Furthermore there are 22,000 bakeries there compared to 250 in Ireland which is approximately 47 per 100,000 compared to 7 per 100,000 in Ireland.

2.7 Socio-historical Perspective

According to Blenkin et al. (1992) and Goodson (1987) has placed great emphasis on curriculum practice from a socio-historical perspective, acknowledging that our understanding of curriculum practice is enhanced by an examination of its historical and social construction. Ireland of the 21st century has evolved from being an agricultural country to a high tech manufacturing state having attracted foreign investors which has impacted on employment and income. Increased disposable income has unquestionably influenced bakery education and training in Ireland.

Historically many factors infringed on bakery curriculum design, school attendance between the age of six and fourteen only became compulsory in 1927 (O'Dowd, 1985, p. 4). According to Devine (1990) in the Journal of the Irish Labour History Society 'Saothar 15'. The 1930,s were difficult years which were dominated by depression, the Economic War and the rise of fascism. Curriculum at the NBS has seen elements of change, not long after its establishment in 1935 the emergency (1935-45) was a period of great demand for bread according to O'Dowd (1985) this was due to the shortages of foodstuffs which were imported from abroad and the shortage of fuel for home baking.

Furthermore O'Meara (1992) in an article in the Bakery World Journal reported on an interview which was conducted with Paddy Shanley General Secretary of the Bakery Union. He stated that bakery workers during World War II in 1939 were the second highest paid

workers, primarily because PAYE taxes were low and there was substantial overtime available for bakers. Consequently this reflected on student numbers attending the NBS with (O'Dowd, 1985, p. 6) noting that numbers increased from 91 in 1943 to 111 in 1947 necessitating the division of classes and holding of some classes until 10 o'clock at night. However, Paddy Shanley noted that by the late 1950s the impact that technology and automation would have on the bakery industry notably employment. Just as the NBS has experienced vibrant curriculum evolution, so too has the Bakery Industry undergone significant change mainly from craft to plant bakeries.

Meanwhile Kane (2008) argues that a number of factors had a detrimental effect on the craft bakeries which are summarised and augmented with supplementary information below.

- 1) The introduction of the Chorleywood Bread-making Process in the 1960's. This was followed by the growth of supermarkets and in-store bakeries such as Superquinn during the 1970's, the era of one-stop shopping where the consumer could get all their essentials under the same roof. Incidentally in 1970 Kennedy's Bakery closed with the loss of 700 jobs. Subsequently this followed the closure of O'Rourke's and Joseph Downes Bakery, (Buttercrust) Finglas.
- 2) Membership of the European Economic Community (EEC) 1973 encouraged competition and cheap imports notably Dutch confectionery which had a detrimental effect on home produced biscuits and confectionery.
- 3) The flour subsidy introduced by the Irish Government in 1972 and continued until 1986 in an attempt to slow down the rate of inflation benefited only the plant bakeries and discriminated against the craft baker. Despite its withdrawal it is argued that the craft baker never recovered.
- 4) Value Added Tax at 21% had a detrimental effect on confectionary producing bakeries, it was the advent of cheap imported confectionery items.
- 5) The introduction of the Hot Bread Shop phenomenon in the 1980's with popular outlets such as Kylemore, Mannings, KC and Anne's Hot Bread Shops. Once again this had a negative effect on the craft baker as they were glorified craft bakeries with similar quality bread to that of plant bread.
- 6) The bread price war in 1989 where by Dunnes Stores reduced the price of the sliced pan from 58p to 35p forcing below cost selling which eventually contributed to the rationalisation of plant bakeries.
- 7) The introduction of the frozen-dough phenomenon and the establishment of Cuisine De France in 1989. The company saw a niche in the market for home produced, high quality in store baked products such as breakfast rolls, pastries and croissants. It became the market leader of freshly baked in store products. This was the advent of forecourt retailing of baked products, which remained very popular during the construction boom.
- 8) The introduction in the 1990's of the gourmet sandwich bar notably O'Briens catered for the busy employees who purchased food on the 'run'.

The 1980s were difficult years for the craft bakeries with emigration, high unemployment and economic depression. However, a Bakery World Newsletter (1984) reported at the time of the innovation and creativity of some craft bakeries, Cotter's Bakery in Bantry, Co. Cork had begun to make Turkestan bread, Muffin's Bakery in Bray had begun to produce 'Jogger's

bread, a health bread containing yogurt for the health conscious consumer and the Bake House Bakery in Letterkenny had begun to produce a sugar-free wholemeal yeast bread.

Similarly the so called “celtic tiger” had an impact on employment and bakery closures which evidently had repercussions for bakery education and training. The so called celtic tiger was not boom for everyone associated with the bakery industry according to Foley (1997) in a Bakery World article titled ‘Time Out for Small Baker?’, which highlighted the demise of the small baker with the number of closures associated with competition from supermarkets, hotels, garages and the par-baked market. In the same article Murt Crotty stated on the imminent closure of the family bakery operating since 1872, stated that ‘The so called Celtic Tiger economy has not made things any easier for the bakery trade’. The bakery industry was very significant in terms of employment and output. The Bakery World Magazines during the 1990,s reported on the closure of many bakeries for example:

1990 Johnson Mooney and O’Brien Ballsbridge, 500 jobs lost

1991 Gateaux loss of 300 part-time and 240 full-time jobs

1991 Lydon’s Bakery, Galway 60 jobs lost

1992 Milford Bakery, Donegal.

1997 Malone’s Bakery, Naas.

Other casualties of the 1990,s were Kelly’s Bakery, Kilcock, Boland’s Bakery, Dublin, Scott’s Bakery, Westport, Co. Mayo, O’Shea’s and Thompson’s Bakeries in Cork, Bradbury’s in Kildare, just to mention a few. Fortunately some well established craft bakeries survived such as Considine’s Bakery, Kilrush which was in 1989 the only remaining bakery in west Clare. Griffin’s Bakery, Galway, Drone’s Bakery, Tipperary, and Barron’s Bakery in Waterford are still some of the very successful bakeries that have been there for generations. Brennans, Dublin and Pat the Baker, Granard, Longford, and Peter Lyons, Drogheda are some of the large existing bread plant bakeries while O’Hara’s, Foxford, Mayo, Tea-time Express, Dublin and Comerfords, Kildare are some of the remaining large cake producers.

Incidentally the milling industry encountered a similar fate, during Dail Eireann questions and answers session on 30th October 1963 Sir Anthony Esmonde asked the Minister for Industry and Commerce the names of the firms licensed to mill wheat. The result was an Official report listing the names of firms holding wheat milling licenses under the Agricultural Produce (Cereals Act). At the time there were 24 flour mills and 40 Wheatenmeal mills and 12 closed mills with milling licence not yet revoked. By 1973 there were 17 large along with 9 small independent mills and in 1989 this had diminished to 9 mills employing 300. Davis Flour Mills, Enniscorthy, closed in 1990 with the loss of 200 employers, others to close were Milford and Bolands Mills. Odlums is the largest surviving mill while Martry Mill at Kells,

Co.Meath and Anna Liffey Mill at Lucan, Co.Dublin which was established along with mills in Kildare and Carlow by George Shackleton relative of the well-known explorer Sir Ernest Shackleton are both still in existence. Imported flour and highly efficient milling systems along with the reduction in home-baking have diminished the number of mills in Ireland.

Some small bakeries capitalised with the property boom by discontinuing or relocating their business so as to sell their valuable premises which were located in prime locations for development, one such bakery was O'Learys in Blackrock. There is resurgence in the small craft baking sector with restaurants such as Roly's in Ballsbridge, The Avoca Cafés in Dublin and Wicklow and Blazing Salads in Dublin producing gourmet style breads and sandwiches while becoming producers of high quality baked products for its restaurant and retail/coffee shop outlets. Baking and cake emporiums have become the norm specialising in exclusive and high class confectionery.

The closure of many bakeries had a knock-on effect on student recruitment particularly apprentices. Students were lured away from the hard work and unsociable hours associated with the bakery. White (2001, p. 269) argues that in 1964 36.8% of sixteen year olds and 24.8% of seventeen year olds remained in full-time education, while corresponding figures for 1994 were 93.6% and 83.3%, the growth in higher education was fuelled by student demand and perhaps accentuated by the announcement of Donagh O'Malley in September 1966 to introduce free post-primary education which evidently reflected on an increase in the number of students pursuing higher education. Student numbers in Third Level Education increased from 18,197 in 1964/65 to 28,614 in 1972/73 and have continued to rise (White, 2000, p. 282).

The NBS is dependant on quality raw materials historically this was problematic during the war years. As mentioned earlier good quality bread is produced with quality raw materials, craftsmanship, and the technical knowledge. During the war Murdoch (2002) states that Bewley's modified their production techniques by substituting oats for flour, producing meringues and substituting custard for fresh cream, this theory is further reinforced by O'Dowd (1985, p. 9) who pertains that flour quality was very poor making it difficult to produce attractive and tasty bread. He states that John Swift founder of the NBS commented on this situation in the Catalogue for the National Bakery Craft Exhibition of 1949:

Yet with all the trials and tribulations the trade made bread for the people. And who would say it was bad bread-even though at times the stacks of dark-brown dishevelled or battered-looking two-pounds in the bread-room looked fearfully like a Paul Henry landscape with its tall turf stacks silhouetted on the grey or purple mists of the western twilight. O'Dowd (1985, p.9)

Swift, (1991, p. 71) acknowledges that all exhibitional work at the NBS was halted during the emergency, due to a shortage of ingredients. This is supported by O'Dowd (1985) who also reinforces Murdoch (2002) by stating that substitute materials such as sliced carrots were used.

Student recruitment and intake necessitates the existence of the NBS. The year 1954 was the same as 2000 due to nil intake of students associated with a decline in employment at the time, while economic growth in ancillary areas among other factors can be associated with the decline in 2000. To overcome the 1954 crisis O'Dowd (1985) states that the Master Bakers agreed to introduction of the Day-Release Scheme for Apprentices in 1954 with the doubling of instruction from three to six hours. The introduction of day release was coupled with the appointment of a second whole-time teacher which merited the very existence of the NBS at the time, while in 2000 short professional baking courses were the solution.

Towards the end of the 1990,s there appeared to be a downturn in the placement and recruitment of students (having had a record high in 1990 of twenty whole time students enrolling) this was also apparent in the 80's which incidentally was a time of high emigration, imports were seen as the main factor affecting the lack of student placement. The NBS has always aspired to linking student qualifications to placement. Research has shown that students taking stop-gap menial work can undermine a graduates' confidence, motivation and mental health according to Nic Fleming Science Correspondent with The Daily Telegraph in his article 5th May 2008. The NBS has always been to the forefront in matching students with jobs. Foley (1996) in a Bakery World article, titled Career Path Changes quoted the following words of encouragement from Derek O'Brien, Head of the NBS to third year students at a conference in Kevin Street,

Just because you do a course in bakery management doesn't mean you will work in bakeries per se', the article articulates that other career opportunities are available in research, quality, technical, laboratory and other areas.

As well as difficulty with student placement there was a difficulty with student recruitment, both affected by bakery closures and the celtic tiger. Meanwhile student retention is as important as student recruitment, the DIT Retention Office monitors and analyses student retention rates with an aim of reaching an 85% completion rate.

To conclude it is notable that legislation, war, emigration, mechanisation, technology, unemployment and the economy have historically impacted on curriculum evolution. What is exceptional with curriculum change at the NBS is that there is a reversion to artisan practices and time honoured techniques of bread production.

2.8 Structural Perspective

Blenkin et al. (1992) argue that central to the structural perspective is the assumption that curriculum change is reflective of the wider economy, social and political structures. Clinch et al. in *After The Celtic Tiger* argue that the US was the propellant which brought the world economy through the boom of the 1990,s. Despite the dot com crash of 2000, 11th September 2001, Afghan conflict, unrest in the middle-east the Irish economy flourished. While nearer to home the onset of foot and mouth in Britain in 2001, the introduction of the euro in 2002, a reduction in EU aid since the 1990,s, and corporation tax harmonisation with EU member states which increased the tax rate from 10% to 12.5% in 2003 making US investment less favourable. The Irish economy remained unperturbed having been the fastest growing economy in Europe in the 1990's. There was an unprecedented demand for housing which saw the construction industry flourish. The population has steadily increased in Ireland with a population of 3,626,087 in 1996 to 4,239,848 in 2006 and is still continuing to grow, while full employment had been reached. Other developments have been with earnings figures from the Central Statistics Office show an increase in wages for males being €428.82 in 1998 and rising to €624.45 in 2006 while social welfare recipients have also benefited with the contributory old age pension rising from €99 in 1998 to €223 in 2008 while child benefit increased from €40 in 1998 to €166 in 2008. All of those influences had a knock-on effect on bakery education and training. Higher disposable income saw a growth in consumer confidence with demand for luxury, healthy, ethnic and organic produce. Some students were opportunists by undertaking bakery education and training, In some cases this introduced them to entrepreneurship while catering for such products.

Public finances remained in good shape, however, by January 2008 an apparent downturn in the Irish economy has been evident with increased unemployment, reduction in house prices, increased fuel costs, budgetary cutbacks etc. The US recession is seen as a major factor and the weakening of the dollar which has seen some US companies in Ireland relocating. Increased interest rates impacted on the housing market and has almost halted the construction industry bringing with it unemployment. Other significant factors are higher fuel prices with oil reaching its highest ever level of \$147 per barrel in July 2008. All of those economic factors may impel on future bakery education and training.

2.8.1 Consumer Patterns

The last decade in Ireland has seen unprecedented economic growth with a feel-good factor coupled with higher disposable income which has seen, increased travel, consumers seeking choice, quality, convenience, and healthy options. We have become a nation of “foodies” as there is growing interest by individuals in the area of food production evident by the increase in the number of cookery schools emerging coupled with television cookery programmes. Celebrity chefs such as Nigella Lawson, Jamie Oliver, Richard Corrigan, Rachel Allen and Clodagh McKenna have launched a new interest in artisan foods and home cooking by producing food from ‘scratch’ using fresh, local and organic ingredients while adding glamour to baking and cooking.

Figures from Mintel show that Shamrock foods the main supplier of home baking products in Ireland have capitalised on this phenomenon with an annual growth of 8% to €45.2m in 2004. This is contingent with there presently being resurgence in the skill and craftsmanship of producing artisan breads. This is evident by the unprecedented number of part-time students participating on short-professional baking classes.

Leader and Chattman (2007, p. 7) state that, ‘a loaf can only be called artisan only if an experienced and sensitive baker has intimately overseen its baking every step of the way’. Individuals are concerned with their well-being and are rejecting chemically induced foods; this is presently being highlighted by a well known supermarket chain that is rejecting hydrogenated and high sodium chloride products. If there was ever an argument against sliced pans it is portrayed by Blythman 24th November 2007 in an article in the Guardian Newspaper stating that,

The majority of shop-bought baked products are made using cheap commodity oils or artery-clogging chemically hardened oils such as soya and palm, the plants for which are likely to have been grown on what was once lush rainforest. That sad, soggy sliced loaf comes with obscure emulsifiers, soft flour, vinegar and enzyme-based crumb softeners derived from animals, fungi, cereals and bacteria. Some of these won’t show up in the list of ingredients because they are deemed, conveniently, to be “processing aids”.

Consumers are becoming very health conscious, this furthered with special dietary needs for diabetics, coelics, low-salt and GI sufferers is a cause to scrutinise a simple loaf of bread. As part of the full-time BSc programme students undertake core modules such as Baked Product Development, Functional Food and Allergens Modules which promote an awareness of all dietary needs.

2.8.2 Health

McKenna (2006) argues that good bread not the supermarket variety is a healthy option being one of the most nutritionally balanced foods around while Bertinet (2007) argues that a brilliant bread crust forces you to really chew your bread, and when you chew you produce saliva, which contains enzymes that break down carbohydrates which promotes proper digestion. Furthermore, he asserts that crustless, additive induced, highly processed commercial breads require less chewing and are often digested improperly leaving individuals feeling bloated and sometimes convinced that they may have a wheat intolerance or allergy.

Nowadays individuals appear to be more health conscious of what they eat the Functional Food Module educates students to cater for this phenomenon. Functional foods have become an integral part of modern day living, those foods have an added ingredient so as to increase their health benefits above their nutritional value, foods in this category are bread with folic acid, milk with added calcium and butter substitutes with omega 3 fatty acids. Super foods are foods which contain high quantities of nutrients which help the body fight disease while promoting a healthier and longer life. Some of those foods are oats, almonds, olive oil, tomatoes, green vegetables, blueberries, oil-rich fish, oranges, chick peas and garlic. Other healthy ingredients are seeds such as sunflower, sesame, poppy and linseed. Kane (2008) reports that the British Medical Journal Lancet (1997) published findings that medical research has associated linseed and soya with phytoestrogens which could have a significant impact on menopausal symptoms. Consequently it has been suggested that a food product containing linseed or soya could be used as an alternative or in addition to, Hormone Replacement Therapy (HRT). The product range and product diversion at the NBS is reflective that dietary needs and healthy options are catered for. Product development and ingredient selection means that most of the main super foods are incorporated into bakery products whether it is bread, cakes, pastries or biscuits making them a very nutritious and a healthy option for the consumer.

Following an outbreak of rickets in the 1940,s fortification of flour begun when calcium in the form of creta preparata was added to the flour, as bread is a staple food accessible to all. This initiative proved very successful with a decrease in the rate of rickets. Currently Ireland has one of the highest incidents of Neural Tube Defects (NTDs) with between 1-1.5 per 1000 births nationally. The Food Safety Authority of Ireland in a press release (28th July 2006) titled 'Mandatory Folic Acid Fortification of Bread Recommended' stated that a report was presented to An Tánaiste and Minister for Health and Children, Mary Harney T.D. by National Committee for Folic Acid Food Fortification. It recommended the mandatory

fortification of most white, brown and wholemeal breads on sale in Ireland with folic acid at a rate of 120µg per 100g of bread. It is a B vitamin when taken prior to conception reduces the rate of NTD's.

Research has revealed that one in four adults on the island of Ireland are currently taking food supplements, consequently the organisation Safe-Food, in collaboration with the Food Safety Authority of Ireland and the Food Standards Agency of Northern Ireland have launched a leaflet detailing what food supplements are and what they do, while reinforcing that food supplements do not substitute a balanced diet. However, there is a growing number of individuals with food allergies or suffer from food intolerance. This growing trend has been influential on curriculum design at the NBS with the introduction of a module on the BSC programme on Food Allergens and Functional Foods, Module descriptors are available in Appendix E. McCann in an article in The Irish Times on 14th March 2008 states that there is a rise in food allergies while noting that an allergy is a medical condition affecting the immune system while intolerance is associated with the digestive system. To facilitate this trend the Food Research Centre at Ashtown under the directorship of Teagasc the Agricultural and Food Development Authority acknowledges that there is a growing demand for low glycaemic (GI), gluten free and organic breads. This is reflective of curriculum design at the NBS.

2.8.3 *Quality*

An increase in disposable income has brought about an air of extravagance and affluence with consumers becoming connoisseurs of luxury, organic and niche items, for example handmade confectionery items, chocolates, artisan and organic products. Consumers that are familiar with artisan breads know the difference and will not settle for anything else and are willing to pay for the privilege of time honoured handcrafted traditional products. Steinberger 20th October 2007 describes in an article in the 'Financial Times' how France since the beginning of the 80's is experiencing a bread renaissance with the late Lionel Piolane being the central innovator who reconciled "artisanal practices (long sourdough fermentation, baking in wood ovens, and so on) with production on a quasi-industrial scale". Furthermore, in the same article the writer details how an American Academic named Steve Kaplan has studied this phenomenon and written a book called '*Good Bread is Back*' (Duke University Press).

Similarly in Ireland such is the demand for wholesome quality food that the number of farmer's markets that are emerging around the country are phenomenon, Kelly (2007) in the Irish Times sights 126 farmer's markets in existence around the country and proceeds to

question if they are an 'elitist fad' or 'saviours of the rural economy', either way it is reflective that consumers are averting to products that are natural, organic, artisan and selective with minimum emphasis on the monetary value while giving the producers a market and to sell their produce. Furthermore, an article in the 'Westmeath Examiner' (2008) by Una D'Arcy states that on a visit to the Mullingar Farmers Market, some of the products available were organic cheese, organic fruit and vegetables, chutneys, jam, organic wine, home bakes, crafts, fresh fish, fresh meat, free-range organic eggs, fresh flowers and plants, an advantage being that produce is local, fresh, and sustaining the local economy. This trend is indicative of the number of individuals seeking places on the part-time professional courses.

2.8.4 Organic Food

Organic food has become a recent phenomenon. In 2002 Teagasc the Irish Agriculture and Food body announced that the sale of organic food had grown steadily from a very low base in Ireland from the mid 1990's accounting for 25m and expecting to treble by 2006. This is reflective of the NBS's practice in ingredient sourcing and selection for example the use of organic rye flour 'Ballybrada' produced by organic German farmers at a Victorian estate in Co. Tipperary. Organic Food and Farming is regulated by The Department of Agriculture, Fisheries, & Food. Wilson 11th January 2008 in a Financial Times article titled '*What makes a pig organic*' commends Ireland for its organic practices and in general she cites organic food as being evasive of food labelling. Meanwhile Lynda Brown, author of *The New Shopper's Guide to Organic Food* (2002) in the same article states that 'Consumers view organic food as a haven. But organic food standards have never been perfect because life isn't perfect'. Environmentalists favour organic produce as organic farming is respectful and mindful of the countryside, environment, and animal welfare.

Organic food is perceived to be a healthy option figures released from the Food Safety Authority of Ireland in a press release on 30 January 2008 state that research has shown that 32% of consumers cite organic food to be healthier while 15% state it is full of flavour and taste. Subsequently information released by the healthcare organisation VHI titled "Organic Food Better for your heart" shows that researchers at the University of California did a ten year study comparing organic tomatoes with standard tomatoes and found that the organic variety had nearly double the amount of flavanoids (an anti-oxidant found in the soil), which have been proven to reduce high blood pressure and lower the risk of heart disease than the non-organic variety. In September 2008 Bord Bia announced that in the last two years there has been an 82% increase in the sale of organic food citing that bread, beef, preserves and

cheese as some of the most likely products to increase in popularity in the coming years. Interestingly the first organic only supermarket named appropriately Eco-Logic opened in Dundrum recently. The demand for organic food is reflected in the choice, selection and use of ingredients used at the NBS. Furthermore students are acquainted with such ingredients during ingredient studies.

2.8.5 Lifestyle

With busy and changing lifestyles notably in the change from the Irish pub culture, leisure pursuits are paramount. Some individuals are participating in the area of food production which is seen to be relaxing, therapeutic and holistic. 'It's a relaxing way of improving your cooking skills' according to Catherine Fulvio proprietor of Ballynocken House in a 'Sunday Times' article 03/02/08. This is symbolic of the number of cookery schools emerging. Ireland has become synonymous with cookery schools such as Ballymaloo House in Co. Cork, Ballyknocken House in Co. Wicklow and Castle Leslie in Co. Monaghan with some of those publishing cookery books.

2.8.6 Food Ethics

Bread has always been liked with social standing ever since the French rebellion when Marie Antoinette was supposed to have said "Let them eat cake" in relation to the peasants who were without bread. Regan (2006) in an article in the Business Post stated that 'White bread was once a status symbol'. In Ireland during the Georgian period, the populace ate wholemeal bread and a small amount of silk cloth-sifted flour was produced to make light, whiter bread for the rich and privileged. In recent times the phrase the 'best thing since the sliced pan' is meriting adverse publicity and increased accountability by the food critics. According to Regan (2006) in an article in the Sunday Business Post 'The humble loaf of bread is not just one of our most common foodstuffs, it's also becoming one of our most controversial'. In the same newspaper article she states that the bread the Earl of Sandwich liked to snack on in the 18th century, when legend has it - he was too engrossed in his pursuits to leave the gambling table, is quite a different bread from today's bread. Consequently there is an unprecedented demand by individuals to partake in part-time bread making courses.

The concept of food policing and security has become a recent phenomenon with food writers and various organisations. Food writers such as Bee Wilson (2008) author of '*Swindled: From Poison Sweets to Counterfeit Coffee-The Dark History of the Food Cheats*' are forthcoming in their criticism of the adulteration of food production. The Slow Food Organisation is an International Organisation with over 80,000 members worldwide, it was established in Italy

by Carlo Petrini in 1986 with origins in Ireland since 1996, its ethos is in supporting biodiversity and promoting artisanal producers of quality produce. The organisation has stringent criteria in place for produce to be classified as slow food, primarily it must be produced by eco-gastronomic practices by being sourced locally while being linked historically, environmentally and socio-historically, and be produced on a small scale. This phenomenon is reflective of the growth in the number of artisan bakeries in Ireland.

Consumers are becoming more discerning about food practices. Food ethics is becoming a moral issue for consumers, individuals are concerned with where their food is coming from, how it is produced, and who is producing it. The Fair Trade Brand according to Quinn on 14th March 2008 in a newspaper article titled 'Fair Deal for Fair Trade' is an example of this, whereby the consumer pays a premium price for products produced in developing countries while the producers in turn obtain a fair price for their produce. Meanwhile the downside of this practice is the environmental or green issue of carbon-footprints and global miles. Currently flowers are becoming an ethical issue as to whether to support the development of Kenyan horticulture or conserve air pollution and air miles or provide food for local inhabitants. Kavanagh (2008) states that every country in the world including Ireland needs to be receptive of climate change so that the planet will be sustainable for future generations.

Changing consumer patterns along with concerns for health, moral issues, ethics, and the environment have been linked with curriculum change at the NBS. As mentioned earlier the module on Food Allergens and Food Intolerance plus the Artisan Bread module are reflective of consumer needs.

2.8.7 Politics

Politics at both a local and national level has implications for curriculum evolution. This section looks at how legislation and decisions at national level have implications for education. Government Legislation has impacted and shaped curriculum. The Green Paper on Education 1985 and the Green Paper on Education 1992 have impacted significantly on the structure of the DIT, the former made recommendations for the reformation of the system of the Vocational Education Committees and proposed that the DIT be established on a statutory basis and according to White (2001) should be more closely related to the rest of the third level education system in Ireland. Meanwhile the Green Paper on Education 1992 according to Duff et al. (2000) made recommendations that there should be an appropriate balance between certificate, diploma, and degree graduates to be maintained, and that the value of diploma and certificate awards as terminal awards should not be undermined. It suggested that a degree course offered by the Institutions should not be delivered more cost effectively by a

university or adversely affect the other and be based on the needs of industry while being supported by, and liaised with industry.

The Dublin Institute of Technology Act 1992 established the DIT as an autonomous institution independent of the City of Dublin Vocational Educational Committee, the act set out that the Institute would provide vocational and technical education and training for the economic, technological, scientific, commercial industrial, social and cultural development of the state. The act enabled the Institute to grant certificates, diplomas, and other educational awards excluding degrees. Duff, Hegarty and Hussey (2000, p. 55) state that in 1997 following a review of the Institutes 1995/1996 quality assurance procedures by an international review team on behalf of the Minister for Education the DIT was granted the awarding of primary and postgraduate degrees and honorary awards. Ten years later the NBS introduced its first primary degree programme.

To date funding for education has not been an issue White (2001, p. 270) argues that education is seen as an investment rather than a consumption, and as such has evaded budgetary cutbacks. The decision by Niamh Bhreathnach in 1997 to abolish student fees for all full-time degrees in universities and public sector colleges meant that education was to be funded to a greater extent from public funds, this is reciprocated with the figures of government expenditure on education. Figures from the Department of Education show that expenditure per student in third level education has increased from €7,816 in 1995/96 to €8,367 in 1999/2000. It has been acknowledged that politics entwined with economics has had an impact on curriculum.

2.8.8 National Qualifications Authority of Ireland

Under the Qualifications (Education and Training) Act 1999 three new organisations were established one of which was the National Qualifications Authority which is a body of fourteen members appointed by the Minister of education and Science. The role of the NQAI is to,

1. The establishment and maintenance of a framework of qualifications for the development, recognition and award of qualifications based on standards of skill or knowledge acquired by learners.
2. The establishment and promotion of the maintenance and improvement of the standards of awards of the further and higher education and training sector, other than the existing universities.

3. The promotion and facilitation of access, transfer and progression throughout the span of education and training provision.

In relation to the DIT its role is to establish the overall awarding standards of the Institute. The NQAI has also a role in Quality Assurance within the DIT. The National Framework of Qualifications was launched in October 2003 with the introduction of new awards in higher education and training since 2004 while the FETAC system commenced in 2006. The framework is comprised of levels. Level descriptors are used in curriculum design and development within higher education as they describe what a learner is expected to achieve at the end of a level of study. They are generally arranged in a hierarchy as a higher level is seen as more complex in learning terms than a lower level. Moon (2002, p. 17) states that '*level descriptors and module aims guide the writing of learning outcomes*'. The NFQ has ten levels covering the initial stages of learning to the more complex. The DIT has the power to award from level six to level ten programmes. As mentioned earlier the BSc. degree programme is a level seven or an ordinary degree level.

2.9 Technology and Science

According to (Hewitt, 2006, p. 24) Jacob Bigelow published *The Elements of Technology* (1829). He is considered an influential figure in bringing about the evolution of technology. His work has conjured up present day developments with the introduction of electronic gadgets such as cell phones and nanotechnology. It is unquestionable that technology has impacted on curriculum design. The emergence of the internet to the USA in May 1995 brought about a "paradigm shift" as students and machines interact. It has transformed the way in which students learn along with the ways in which teaching is delivered.

Duff, Hegarty and Hussey (2000) articulate that technology, with the emergence of digital computers which have multiplicity of applications and expedient storage, retrieval and dissemination of information, has influenced teaching and learning. Furthermore (Barnett & Coate, 2005, p. 89) notes that technology has impacted on the student-teacher relationship as the dissemination of knowledge has changed. In some cases lecture theatres, laboratories and libraries have almost become redundant. Information technology has impacted on curriculum design at the NBS with students becoming proficient at computing which encourages them to become independent learners while taking control of what and when they learn. E-learning does not facilitate all types of learning however it has been integrated into the BSc. in Baking and Pastry Arts Management course. Students are introduced to learning in virtual learning environments. Information technology has become an integral part of student learning at the

NBS. Curriculum planners need to facilitate neomillennials (children of the Internet age) who have become accustomed to technology. The following statements explain the insatiable appetite young people have towards electronic gadgets and the significance of technology in education,

The learners of the near future will be what Greg Dyke, current Director- General of the BBC, calls the 'Playstation generation'. They will be accustomed to highly immediate, interactive, visual electronic resources. They will want learning that is: 'Just in time, just for me, just a keystroke, just for now'.

Spender (1999) cited in (Salmon, 2000, p. 90)

This phenomenon is spiralling with young peoples' use of laptops, iPod, playstations, nintendos, MP3 players and sophisticated mobile phones. The internet, World Wide Web, e-mail, and WebCt are major technical advancements which have promoted communication, learning and research for students.

Beane et al. (1986, p. 91) asserts that that technology is not specifically confined to the emergence of computers. It is everywhere from home to work, leisure, communications and transportation while enhancing the quality of living. More and more large bakeries manage their production processes with computer applications; this contributes to increased economic efficiency and enhanced product control. Almost all production machinery within the bakery industry is available in computerised form. Technology has improved the delivery of teaching with the use of electronic white boards, power point presentations, electronic storage, and virtual classrooms just some of the advancements associated with technology.

O'Sullivan (2008) in an article in the 'Sunday Times' states that in 2003 the Department of Education approved an online teacher training programme for primary education, initially controversial it has become acceptable that online learning offers choice and typifies learner needs. Similarly in the same article she exonerates that the UK based Open University programme has currently 7000 Irish Students this is reflective of the contemporary student and the need for flexible learning. The courses offered at the NBS are predominantly skills orientated requiring student participation, however with modern technology perhaps in the future some modules may be delivered on-line

Blenkin et al. (1994) argues that technology is seen as the most dominant means of conceptualising and initiating curriculum change in the 1960's. To put this statement into perspective it is indeed reflective of curriculum change at the NBS with the introduction of

the Chorleywood Bread-making Process (CBP). This process was developed as a result of a combination of technology and science. It is based on the principle of mechanical dough development in conjunction with the use of oxidising chemicals. According to Fance (1989) the CBP was developed in 1961 by the British Baking Industries Research Association with the view to eliminating the fermentation process of dough making, this was the inception of the sliced pan which proved to be very popular with the growth of supermarkets in the 70's.

Students were introduced to the Chorleywood Bread-making Process while maintaining the traditional techniques. This process has become unpopular in recent years as consumers have become averse to those products and are seeking quality, choice, natural, and organic options. In relation to this bread making practice Whitley (2006) incites the notion that British consumers have been involved without their knowledge in a 'flawed experiment'. However, its popularity remains with its convenience and economical attributes. Some bakeries are improving its aesthetic and health qualities by the addition of healthy optional ingredients, for example sesame, linseed, sunflower and other types of seeds. Large bakeries have identified consumer appreciation for hand crafted artisan breads and some are promoting their breads on national television as handcrafted using age old traditional methods. Regan (2006) in an article in the Sunday Business Post acknowledges that 85% of bread in Ireland is produced using the CBP, which produces bread with great efficiency and at extremely low cost, but involves the use of enzymes, which do not have to be labelled.

The NBS has always aspired to using a scientific approach using quality raw materials, careful measuring and weighing supported with the technical skills and knowledge. Perfectly good bread is made from flour, salt, water, and yeast, using natural methods of fermentation. Alternatively the CBP of bread-making involves the use of the basic ingredients with the flour containing bleach and other flour treatment agents and being specially milled to retain additional water. Other ingredients generally used in the process are emulsifiers, improvers, enzymes, preservatives.

According to Whitley (2006, p. 3) technology has found ways to adulterate bread while science is revealing the havoc which this may be causing to public health this is subsequently reinforced by Wilson (2008). She states that 'the enzyme transglutaminase can make wheat protein toxic for those sensitised to gluten'. Another enzyme phospholipase, which can be derived from the pancreas of pigs making it unethical for consumption by Muslims, Jews, and Vegetarians without them having an informed choice. Until 1990 potassium bromate was used in bread making which was found by Japanese scientists to be a carcinogen. He notes

that good bread requires the selection of quality raw materials, an understanding of the technical and scientific knowledge along with the required craftsmanship and skills.

Fortunately consumers are been given an informed choice by the print media, for example Clarke (2008) states in an article in the 'Sunday Times' 27th January 2008 that 'cheap bread is full of emulsifiers', flour-treatment agents, bleach, flavourings and unacceptably high volumes of water and grease'. In May 2005 Derek O'Brien, Head of the NBS invited a team of influential Irish Food Writers to the NBS. They were given the opportunity to partake in artisan bread-making under the guidance of the National Baking Team from the NBS. This was an opportunity for them to evaluate the merits of good bread. The deterioration in bread quality is reflected in its consumption. Whitley (2006, p. 5) compares similar practices with the consumption of bread trends in Ireland and the United Kingdom using the following quotation to support his view:

The Irish bread Industry is driven by spreadsheets and low prices, commented Derek O'Brien, Head of the National Bakery School in Dublin, in 2004. We produce some of the least expensive bread in Europe. But the result? Our bread consumption is one of the lowest in Europe. This is an appalling situation, particularly for the remaining number of smaller bakers, because their future is to a great extent dictated by the industrial baker.

This statement is contingent with figures available from Mintel showing that the consumption of bread in Republic of Ireland has slowly declined with the average weekly consumption falling from 1428g per person in 2000 to 1348g in 2005. Meanwhile Edwards (Dec, 2007) in an article in the 'Financial Times' states that bread consumption is a static 58kg per person per year in France while in the United kingdom it is 37kg and rising due to the fact that real bread is a new phenomenon there. However, a positive perspective is that there has been an increase in the usage of flour in Ireland since 2007 which was highlighted by the national media.

Lander (2007) in an article in the 'Financial Times' acknowledges that the production of artisan breads have become an integral part of restaurant life and requires the specialised craftsmanship of the baker which is some what unique to that of a chef or pastry chef while verifying that skill and technical experience separate the professions. Subsequently he observes that, there is a "dysfunctional relationship" between the baker, pastry chef and chef.

Stein (2007) in an article for the 'Guardian Newspaper' states that "baking and pastry making is like a science-all the measuring of quantities and temperatures", this statement is certainly reflective of the practice at the NBS with a strong scientific ethos being enforced from its

inception. Swift (2001, p. 71) contends that Jonathan Swift founder of the NBS was anxious from the onset that students would acquire some scientific knowledge of the ingredients of bakery products. Consequently full-time bakery course students are familiar with microbiology, laboratory and applied science subjects. Meanwhile Hayden (2006) in an article in 'The Sunday Business Post' states that:

Unlike cooking, baking is an exact science and while in theory there is nothing to stop you throwing a few dates into a cottage loaf, if you mess with yeast quantities, proving times or water and oven temperatures, your boule could end up resembling a bap", while reinforcing the precision and accuracy required in the skill and craftsmanship of bread making.

Another development brought about by technology was the introduction of the hi-ratio method of cake making, a system introduced from the USA in the 1930's, this advancement brought about the introduction of a specialised chemically treated flour capable of retaining high amounts of liquid and sugar, in conjunction with emulsifying agents, making it commercially viable to produce vast amounts of cake products, again this practice was popular until the introduction and EU controls on ingredients and food labelling. In recent years the hi-ratio method of cake making has been modified so as to conform to food additive requirements, students are taught this method of cake making while augmenting their knowledge of this practice in cake technology and ingredient study classes. Technology advancement within food processing is receiving widespread criticism according to Clarke (2008) in the 'Sunday Times' and proceeds to state that food writer and historian Bee Wilson believes that 'technology has brought with it new ways of tampering with food, and new and powerful markets in which to sell it: crispers for flabby foods, softeners for hard food, all manner of dyes and flavours and deodorants'.

Meanwhile the authors of '*After the Celtic Tiger*' argue that the boom of the Irish economy was accentuated by new technologies and their impact on productivity. However, for the bakery industry it appears that technology has not impacted favourably. New technology has impacted on bakery closures due to reduced personnel requirements. Similarly, Beane et al. (1986, p. 91) state that, 'Technology has created problems. Workers have found themselves unemployed, replaced by machines'. Subsequently emerging evidence of the impact of technology on bread production has not been positive. It remains to be seen if the bakery industry will encompass traditional bread making techniques associated with positive health and well-being. Meanwhile the advancement in information technology has successfully imparted on teaching, learning, administration and research. Finally (Posner, 2004, p. 246)

envisages that the administration of standardised tests using networked computers will escalate in the near future.

This chapter has looked at a selection of relevant literature that surrounds curriculum, curriculum evolution and the various factors which have contributed to curriculum change as a means of creating an analytical framework against which the findings of the research can be understood.

CHAPTER THREE

Research Design

3.1 Introduction

This research analysed curriculum evolution and established what factors have impacted on curriculum change. Crotty (2000) argues that the research design should be reflective of the theoretical perspective, epistemology, methodology, methods and the ethical considerations. It is within this framework that this research design has been structured incorporating a case study approach within a constructivist paradigm. The underpinning theoretical perspective and epistemology is also presented along with other aspects of the research

3.2 Theoretical Perspective

Crotty (1998, p. 3) states that ‘the theoretical perspective is the philosophical stance informing the methodology and thus providing a context for the process and grounding its logic and criteria’. Consequently the theoretical perspective associated with a single case study is a hermeneutic or interpretivist based approach. Hermeneutics is derived from the Greek word (hermeneuein) which means to interpret or understand.

One well-known interpretivist as documented by Scott & Usher (1996, p. 17) was Thomas Kuhn who is best known for his work ‘*The Structures of Scientific Revolution*’, (1970). He has contributed to bringing about a paradigm shift as he challenged the empiricist epistemology by proving there is a hermeneutic or interpretive dimension to science. Kuhn believes that knowledge, both in the natural and social sciences, is an ongoing historical, social achievement, which is neither linear or teleological but is characterised by disruption and discontinuity. The interpretive approach uses qualitative methods and is carried out at a micro level, which produces rich accounts and descriptions which is seen to be more favorable to the impersonal statistics of positivists using quantitative methods. Creswell (2003, p.18) states that ‘a qualitative approach is one in which the inquirer makes knowledge claims based primarily on constructivist perspectives’ which places emphasis on eliciting deeper insights from experiences with intent on developing a theory. In keeping with the interpretive perspective and using a qualitative approach interviews with college lecturers and surveys with students were the chosen research methods as rich in-depth accounts are relayed.

Habermas (1987) sees the interpretive or hermeneutic sciences, including some of the social sciences, employing practical modes of reasoning, where methodology does not consist of following invariant procedures and rules of method. Habermas believes that knowledge is

socially constructed and geared to a particular interest, has a practical interest, technical problem-solving interest, critical emancipatory interest, or an interest which is manifested through actions. The interpretivist view is that meaning is not discovered but constructed hence the epistemological view is based on constructivism. In relation to this research, theory is constructed based on experience as the researcher strives to interpret and understand the personal perspective and experiences of individuals namely the lecturers being interviewed.

3.3 Epistemology

The epistemology chosen for this research is constructivism as it is reflective of the way in which individuals construct theory based on their experience. Crotty (1998, p. 3) states that epistemology is the ‘theory of knowledge embedded in the theoretical perspective and thereby in the methodology’. The foundations of modern constructivism can be traced to Greek Philosophy notably Plato. He believed that knowledge is innate or inborn and all that a teacher needs to do is to assist an individual to recall. ‘Therefore according to Plato learning is recollection and recollection is the search for and discovery of innate ideas followed by the construction of new concepts from those ideas’ cited in Posner (2004, p. 61). This is reinforced by Crotty (1998, p. 44) ‘we do not create meaning but we construct meaning’. Meanwhile Stake (1995, p. 99) states that ‘Most contemporary qualitative researchers nourish the belief that knowledge is constructed rather than discovered’. Words are the foundation in this research which the researcher seeks to interpret.

3.4 Case Study Methodology

Methodology is the strategy, plan of action process or design lying behind the choice and use of particular methods and linking the choice and use of particular methods to the desired outcomes Crotty (1998). The case methodology was selected for this study using multiple sources of evidence to analyse and evaluate a phenomenon that being curriculum evolution at the NBS. The case study methodology is significant to this study as it attempts to take an in-depth look at the case from a micro perspective while understanding the specifics of the research questions. This case study is depicted by a single case study using qualitative data collection methods which provides the theory and evidence necessary for verification and replication of the study. It provides theory from an extensive literature carried out and evidence from the in-depth interviews and survey conducted. This approach offers a means of triangulation.

A case study may be defined as an empirical enquiry that investigates a contemporary phenomenon within its real-life context when the boundaries between phenomenon and context are not clearly evident, and in which multiple sources of evidence are used.

Yin (1998, p. 23) cited in (Miller & Brewer, 2003, p. 22)

Creswell (2007, p. 73) chooses to view a case study as a methodology, 'a type of design in qualitative research, or an object of study, as well as a product of enquiry' Barlett et al. (2004, p.54) argue that the case study method is seen as a means of promoting validity by using both qualitative and / or quantitative sources of evidence. Meanwhile Wisker (2001, p.190) states that the advantage of this methodology is that an in-depth situation or individual can be fully explored. The key to completing a successful case study is the reliance on the underpinning theoretical concept to guide its design. Yin (2003, p.3) states that 'Reliance on theoretical concepts to guide the design and data collection for case studies remains one of the most important strategies for completing successful case studies'.

Case studies are used extensively across a range of social sciences including sociology, political science, psychology, history, economics, education and management. Tellis (1997) states that Yin (1993) identified three types of case studies: exploratory, explanatory and descriptive while Stake (1995) includes three others: instrumental, intrinsic and collective. This study is reflective of what Yin depicts as an exploratory because it attempts to explore a phenomenon namely curriculum evolution. Case studies can establish cause and effect while fully exploring an individual or structure ensuring an in-depth, rich account, which is pertinent when evaluating a change in curriculum practice. Data was collected from primary and secondary sources. The primary sources were concerned with oral account / interviews, survey, with the inclusion of published and unpublished papers, while the secondary sources were used to supplement primary sources in the form of textbooks, encyclopedia, journals, and the internet. Primary sources are produced by those directly involved in or witnesses to a particular historical account episode or issue, secondary sources are written after the event, usually by those who are not party to it McCullough & Richardson (2000, p. 79).

3.5 Method

Data collection was essential for compiling this study hence qualitative data gathering techniques were employed namely interviews and a survey were conducted to obtain and to interpret the required data. Methods are the techniques or procedures used to gather and analyse data related to some research question or hypothesis. The methods used are based on the nature of the enquiry and the data required. In this case study research the following methods were employed,

- a) Interviews
- b) survey

3.5.1 Interviews

The purpose of the interviews was to obtain a first hand account of curriculum evolution from a lecturers' perspective, the interview questions are in Appendix A. The lecturers interviewed are professional practitioners who have witnessed and understand this phenomenon. Gillham (2000) states that, interviews are used in research so as to obtain information and understanding of issues relevant to the aim and specific question of a research project. This statement reinforces the selection of interviews as a research method. Five whole-time lecturers were selected (three male / two female) which was believed to provide adequate representation and insight into a particular setting namely curriculum evolution at the NBS. (Denzin & Lincoln 2005, p. 698) argue that interviewing as a method of data gathering is favoured by qualitative and quantitative researchers as interviewing individuals is an excellent way of capturing an event. Individuals can give an in-depth, rich experiential account of events. They can also link the past to the present, however the interviewer must be aware that interviewees may have a selective memory, be biased, and have a nostalgic fondness for the past Picciano (2004).

The aim of the interviews was to evaluate the development of the programme within the NBS, which involved interviewing the five whole-time lecturers who partook in the course programme committees, writers of module descriptors, and those involved in the validation process. Historical information can be preserved through oral history hence it is imperative to retain original sources, with the consent of participants the interviews were digitally recorded. The research interview has been defined as:

A two- person conversation initiated by the interviewer for the specific purpose of obtaining him [sic] on content specified by research objectives of systematic description, prediction, or explanation'.

Cannell and Kahn (1968, p. 527) cited in (Cohen et al.,2005, p. 269)

The research was conducted using semi-structured and unstructured style interviews (Wisker, 2001), this is partly due to the magnitude of the research. Both styles allow for divergence which allows for a unique experience to be recalled while the semi-structured allows for specific questions to be asked. This style allows for additional information to be relayed during the interview which could contribute enormously to the study be conducted. The five lecturers selected for interviewing have many years combined lecturing experience at the NBS with the longest serving member there since 1972. They have first hand experience of curriculum evolution there and are a very valuable attribute to this study.

3.5.1.1 Organising the interview

Having initiated contact with participants and received written consent from them prior to the interview, the following occurred,

- I. Written notification to interviewees regarding interview details was administered. Interviewees were supplied with a research information sheet, an ethics statement and a consent form to be signed by participants prior to the interviews.
- II. An interview schedule was devised
- III. Interview questions were prepared and administered prior to the interview.
- IV. Recording equipment was available.

The interviews were conducted in April 2008 and were of a forty five minute duration.

3.5.2 Surveys

A survey was conducted in February 2008 with 12 participants who travelled to Weinheim in Germany to participate there on a short bread-making course at the German Baking Academy (Akademie Deutsches Backerhandwerk), appendix B and C contains those questionnaires. This survey was intended to evaluate the learning outcome from a student's perspective. This is an unvalidated professional development course, consequently it has never been evaluated before. Students participated in a survey by completing a questionnaire before and after the event so as to give in-depth knowledge of the students learning experience.

Typically surveys gather data at a particular point in time with the intention of describing the nature of existing conditions, or identifying standards against which existing conditions can be compared, or determined the relationships that exist between specific events. Cohen et al. (2000, p. 169)

The survey was conducted by administering two questionnaires which are in Appendix B and Appendix C. According to Foddy (1993, p. 17) if a question-answer sequence is to be successful then the following steps must occur,

- a) The researcher must be clear about the nature of the information required and encode a request for this information.
- b) The respondent must encode this request in a way the researcher intends it to be decoded.

- c) The respondent must encode an answer that contains the information the researcher has requested.
- d) The researcher must decode the answer as the respondent intended it to be decoded.

The questions constructed for the survey were what Belson (1981) describes in his list of sixteen question categories as those using qualifying phrases or clauses so as to promote clarity and extract the required information from participants.

On completion of the course participants completed a questionnaire which was administered by the German Baking Academy so as to evaluate their course. To comprehensively evaluate the programme triangulation of the results of the surveys carried out would be very interesting.

3.5.3 Document Analysis

It was my intention to use document analysis as a primary source. Documents can be stored at various locations including school archives, on-line, or libraries, unfortunately time constraints prevented this from materialising. However, a wide range of documents were utilised during the course of this research some were retrieved from archives at the Irish History Labour Museum in Dublin. Document analysis can be challenging for the researcher, as it involves perusing over a large range of documents that can extend over a large period of time, notably unpublished documents may be difficult to find. Documents are not restricted to text but can include pictures, diagrams, charts, while electronic documents may be inclusive of sound. It is worth noting that document analysis is an inexpensive way of obtaining data. The data can be organised, coded, and transferred into electronic form. The power, speed, and capacity of personal computers along with the capabilities of software packages available make electronic storage of data an ideal medium for its storage and retrieval.

The following are a list of some of the documents that have been utilized during the research,

- Department of Education, publications
- Bakery Production and Management Course Programme Document
- FAS Training and Employment Authority / Course Programme Document (1997)
- Baking and Technology Department (NBS) records, files, minutes of meetings (course committee/validation)
- Higher Certificate in Baking and Pastry Arts Management Course Programme Documents (2003)
- BSc in Baking and Pastry Arts Management Course Programme Document (2006)
- DIT Quality Assurance Document

- Newsletters
- Reports
- Newspapers
- Journals
- On-line papers.

The authenticity of a document often arises, Prior (2003:24) states that,

Questions concerning the authenticity of a document often arise in the research area. Such questions are, of course, essential – and they often shed direct light on important issues concerning the reliability of text as evidence.

It is acknowledged that researchers need to be meticulous in establishing the authenticity of documents, hence documents need to be evaluated, this is often referred to as historical criticism. Historical criticism can be either external criticism or internal criticism. External criticism focuses on the genuineness or originality of the data this can be indicated by seals on school reports, handwriting, or signatures. Internal criticism is concerned with the value or worth of the data, for example was the author biased or reliable. Throughout the research triangulation prevailed at all times which established the authenticity of data. It is worth noting that the authenticity of documents did not arise during the course of this study.

3.6 Outline of any other aspects of the research design

Issues concerning validity, reliability and credibility did not arise during the course of this study however it is worth mentioning their relevance to this type of study.

3.6.1 *Validity*

When carrying out research, professional etiquette should prevail at all times, and certain codes of practice adhered to. The findings should be valid, reliable, and credible, with truthfulness being paramount. Validity involves, carefully constructing definitions of your concepts, hypotheses or proposition and presenting the findings as facts, which are truthful, and accurate, if the results are to be accurate then the research methods employed must be capable of measuring what they are supposed to measure.

Barlett et al. (2001) argue that validity can be measured by qualitative or quantitative methods. Quantitative methods are tried and tested, based on truths, and are capable of being repeated, making it easy to assess its reliability. Validity by quantitative methods can be improved by careful sampling and by using approved or modern statistical systems.

Cohen et al. (2000, p.105) quotes that 'In qualitative data, validity might be addressed through honesty, depth, richness, and scope of the data achieved, the participants approached, the extent of triangulation and the disinterestedness or objectivity of the researcher, supporting the validity of qualitative methods'. Interestingly Hart (2005, p.53) instils a level of scepticism within the researcher, by stating that some research has a level of, 'Unsubstantiated generalisation, political and ethical bias, and on rare occasions, fraud'.

3.6.2 Reliability

Reliability in relation to research design addresses the consistency of the method of the research. It questions if it is capable of being repeated, giving similar results, under constant conditions, on all occasions. Evidently an unreliable test will give different results every time. It can be said that a reliable item may not be valid. One considers quantitative methods of research to be reliable, however when using sampling, the numbers used should be large enough to reflect the larger population, as sampling is not only confined to experimental and quantitative methods.

3.6.3 Credibility

Credibility in research design looks at the findings to see if they can be substantiated. In order for research to be credible there needs to be controls in place to monitor its credibility. Robson (1933, p. 1090) states that Shipman (1998) has suggested that we should go beyond the traditional concerns for reliability, validity, and generalisation, when considering the trustworthiness of research and also the question. "Is there sufficient detail in the manner in which the evidence is produced, for the credibility of the research to be assessed"? Hence the researcher must adequately inform of the methods used and their justification. The case study methodology gains credibility by the use of triangulation. Denzin and Lincoln (2005, p. 443) argue that a case study gains 'credibility by thoroughly triangulating the descriptions and interpretations, not just in a single step but continuously throughout the period of study. As already outlined this research is triangulated by the findings from the interviews and survey conducted in conjunction with an extensive literature review.

3.7 Limitations Experienced in Conducting the Research

- a) Time Constraints, working within a limited time frame restricted the study.
- b) Unavailability of documentation, for example in some cases minutes of meetings were not maintained or retained.
- c) Limited human resources to consolidate information, there is no secretarial service in place at the NBS which restricted access to data.
- d) Interviews were restricted to five interviews with academic staff at the NBS. Interviews were not carried out with other schools that deliver and share modules with the NBS.

3.8 Timeline of the research

The following table summarises the timeline of the research.

Table 3: Timeline of the research

Time Line	
<i>September / November 2007</i>	Research Proposal / literature Review. Data gathering
<i>December 2007</i>	Prepare Interview Questions /Survey Questionnaires
<i>January 2008</i>	Devise interview schedule
<i>February 2008</i>	Student Survey
<i>March 2008</i>	Interview acceptance completed
<i>April 2008</i>	Interviews Conducted
<i>May 2008</i>	Data Analysis / Evaluation
<i>June 2008</i>	Deferral requested and granted
<i>September / December 2008</i>	Write Up, Editing, Copy-editing / Proof Reading 1 st Draft Thesis completed
<i>January 2009</i>	2 nd Draft Thesis completed
<i>April 2009</i>	3 rd Draft Thesis completed
<i>May 2009</i>	Printing and Binding
<i>June 2009</i>	Submission of Final Thesis

3.9 Ethics

Higher Education Institutes including the Dublin Institute of Technology have their own ethical guidelines and protocols for carrying out research, which cover issues such as confidentiality, security, and privacy. It is within those guidelines that this research has been undertaken. Duff et al. (2000:127) state that

“The institution should have an ethics committee with a remit to develop a code of research and teaching ethics and monitor the compliance of all research and teaching carried out under the aegis of the institution with that code”. Furthermore, they contend that the ethos of a higher education institution is developed and promoted by the professionalism of staff at all levels. The DIT Research Ethics Committee provide guidelines for researchers on their DIT website. Subsequently Robson (2002, p. 66) defines ethics as follows,

A distinction is sometimes made between ethics and morals. While both are concerned with what is good or bad, right or wrong, ethics is usually taken as referring to general principles of what one ought to do, while morals are usually taken as concerned with whether or not a specific act is consistent with accepted notions of right and wrong. The term ‘ethical’ and ‘moral’ are subsequently used interchangeably in this text to refer to ‘proper’ conduct.

It is worth noting that research ethics has been highly influenced by the development of four main ethical statements, the Nuremberg Code (1947), the Declaration of Helsinki (1964), the Belmont Report (1979), and the Council for International Organisation of Medical Sciences (CIOMS) (1982) cited in Israel and Hay (2006, p. 23) and Denzin and Lincoln (2005, p. 97).

To ensure that I have complied with ethical principles I have ensured that the British Education Research Association guidelines have been followed in conjunction with the DIT guidelines and policies while ensuring that the following procedures have been undertaken,

1. Individuals are adequately informed of the purpose of the research.
2. Individuals are voluntary participants of the research.
3. Individuals can withdraw from the research at any time.
4. Individual’s anonymity and confidentiality will be maintained.
5. The information will be preserved and reported solely in the form of a thesis
6. Adequate precautions will be taken to ensure that adequate security and storage is available for the data.

This research is supervised and controlled by the guidelines and protocols contained within the Dublin Institute of Technology code of ethics. Professional etiquette has prevailed at all

times throughout this research. Participants involved in the research have been informed of the purpose of the research, provided with an ethics statement and a consent form so as to endorse their participation in the research. Good ethical practice was found for this research in consultation with my supervisor.

3.10 Literature Search

Literature research is a pre-requisite before embarking on any research project so as to explore what is already known about the topic.

Hart (2001, p. 2) suggests that there are two main areas to be searched when an individual is undertaking a research project:

- The literature relevant to the topic;
- The literature on research methodology.

The literature search involved searching for a wide range of information from various sources including the library, internet, databases, archives, state departments and organizations, college departments etc. To acknowledge Hart's assumption of a literature search the research focuses on the literature available in relation to curriculum, the factors responsible for curriculum change and the methodology. There are many influential factors on curriculum change which extended to the use of many sources. Meanwhile the reference accompanying the research will inform the reader of the material consulted throughout the research.

3.11 Literature Review

The literature review documents the available literature that embodies the research question using as many sources as is possible in relation to curriculum and curriculum change.

A useful definition of a literature review is,

‘The selection of available documents (both published and unpublished) on the topic, which contain information, ideas, data and evidence written from a particular standpoint to fulfil certain aims or express certain views on the nature of the topic and how it is to be investigated, and the effective evaluation of these documents in relation to the research being proposed.

Hart (1998:13)

- The function of the literature review was undertaken as a preparatory stage to gathering data and serves to familiarise the researcher with the available research on the subject. Cohen *et al* (2005).The literature review explores the possibility that the following have impacted on curriculum change at the NBS,

- Technology and science :
- Culture
- Micropolitics
- Professional development,
- Politics / economy
- Socio-historical.

Throughout the research a wide range of sources have been utilized including textbooks, academic and trade journals, newspapers, thesis, published and unpublished academic papers, internet, and documents.

3.12 Data Analysis

There is no single accepted approach to analysing qualitative data but there are several guidelines available, (Creswell 2008, p. 245) states that ‘it is an eclectic process’

For the purpose of this research the data gathered from the in-depth interviews were analysed using the framework adapted and based on Creswell (2008) which transcends into drawing up lists of coded text followed by developing themes and then deciding on descriptive text by using direct quotations from the data gathered from the in-depth interviews in order to answer the research questions. The survey carried out with the students undertaking professional development was a minor part of this research and did not necessitate in-depth analysis. According to (Creswell, 2008, p. 244) analysing qualitative data involves understanding and making sense of the data gathered so that it can assist in answering the research questions. Creswell states that there are six steps commonly used in data analysis which are as follows,

- 1) The Researcher collects data. Collecting data for this research involved carrying out a number of interviews with lecturing staff and a survey with students who undertook a professional development course in Germany
- 2) The Researcher prepares data for analysis. Listening to and transcribing audio-taped interviews into text and writing up the interviews.
- 3) The Researcher reads through data which involves Reading through the individual interview transcripts a number of times

- 4) The researcher codes the data which involves segmenting the text.
- 5) The researcher codes the text for description to be used in the research report or selects suitable quotes so as to answer the research questions.
- 6) The researcher codes the data for themes to be used in the research report

Transcribing and listening to audiotapes while converting it into text is time consuming and is reflective of the number of interviews conducted for this research.

3.12.1 Organising the data

The text from each interview was coded, Appendix F presents an example of how an interview was coded. Subsequently the data was then coded for emerging themes. The emerging themes from all the interviews are presented in Table 4 in Chapter 4.

The following is an example of the use of descriptive text as in the Presentation of Findings Chapter 4 whereby a direct quotation is utilised in an attempt to substantiate findings and answer the research questions.

Yes there has been much change, the Diploma in Bakery Production and Management was replaced by new programmes including 5 professional development programmes. Bakery apprenticeship training was finalised along with the sugar craft courses. The Higher Certificate course was introduced and then phased out to be replaced with the Ordinary Degree course. Delivery methods have also changed with the introduction of baking modules. These new modules also streamlined the course to fit in with general modularisation of courses throughout the DIT. Lecturer 1

In the chapter following primary research findings from the fieldwork are presented

CHAPTER FOUR

Presentation of Findings

4.1 Introduction

This chapter examines the findings from both the interviews conducted with lecturers from the National Bakery School and the questionnaires completed by participants during the German Bread-making course. Creswell (2008) provided the framework for analysis of the interviews based on thematic analysis where-by a table is drawn up to highlight the emerging themes prior to using direct quotations to support and augment the findings. The full transcripts of the interviews are available in Appendix A. The interviews were conducted with the five whole-time lecturers at the NBS between 31st March and 3rd April 2008. Their input was considered significant for the authenticity of the research as they have first hand experience of curriculum evolution at the NBS in the last decade, and each one specialises in a specific area which is reflected in the findings.

A survey was conducted with twelve participants who travelled to Germany Monday 11th February 2008 and returned Friday 15th February 2008. A questionnaire was completed at the onset of the course so as to establish students' expectations and aspirations, full transcripts are available in Appendix B. Meanwhile a second questionnaire was completed at the end of the course. This was believed to give an in-depth account of the learning experience. This was the first time that the experience was evaluated which compares the course delivery, learning experience with that of the NBS. This survey could have future use for the NBS which would be in keeping with the German practice of course evaluation. The survey was a minor part of the research and did not necessitate in-depth analysis.

4.2 Section 1

Section one examines the findings from the interviews carried out. The interviewees answered ten questions during a forty five minute interview. This gave an insight into curriculum evolution at the School. The following is a table of emerging themes from the data analysis carried out on the interviews.

Table 4: Themes emanating from interviews

Interview Questions	Emerging Interview Themes
Q1 In the last decade has there been a change in curriculum practice at the NBS?	Significant change namely, <ul style="list-style-type: none"> • Cessation of a number of courses. • Introduction of a new courses • Modularisation and semesterisation • Collaboration with Germany • Course Delivery • Course Content
Q2 In the past decade what do you see as been the main contributors to a shift in curriculum?	Changes brought about by, <ul style="list-style-type: none"> • Consumerism • Bakery Industry • Student Profile • Personal interests • Health Consciousness • Travel • Entrepreneurship
Q3 Has technology and science impacted on curriculum practice?	Technology has affected, <ul style="list-style-type: none"> • Student Learning • Course Delivery • Segmentation of the Bakery Industry Science has impacted on, <ul style="list-style-type: none"> • Safety and Hygiene • Initiated new modules ie. Food Allergens and Intolerances and Functional Food • Laboratory Science (more restricted)
Q4 What changes if any have been made at the NBS to facilitate a change in culture?	Many changes, <ul style="list-style-type: none"> • Modularisation and Semesterisation • Course content • Course flexibility • Course delivery, hands-on practical classes diminished language barriers • Transferability with ECTS. • Retention of collaboration with Germany
Q5 Has economic growth impacted on curriculum development?	Increased demand for part-time courses. Mainly due to, <ul style="list-style-type: none"> • Increased disposable income • Travel • Employment • Immigration • Consumerism • Bakery Education awareness. • Food Appreciation • Entrepreneurship eg. niche markets • Quality Consciousness.
Q6 Have consumer patterns impacted on curriculum design?	Course content now appeals to a broader spectrum of Individuals including, <ul style="list-style-type: none"> • Multi-cultural • Multi-denominational • Food connoisseurs or 'Foodies' • Health and environmentally conscious.

Q7 Has there been a change in student profile with the introduction of modularisation?	A change in student profile is evident based on, <ul style="list-style-type: none"> • Age • Gender • Nationality
Q8 Has DIT Policy and National or European Legislation impacted on curriculum design? Eg (Bologna Agreement 1999) and the DIT Act 1992.	The two key emerging themes were, <ul style="list-style-type: none"> • Quality Assurance • Modularisation / three-hour lectures
Q9 Does staff professional development within the NBS facilitate a change in curriculum design?	Staff professional development has influenced, <ul style="list-style-type: none"> • Course content • Course delivery • Course planning • Scholarship
Q10 Has collaboration between the National Bakery School and the German Baking Academy impacted on curriculum design?	Collaboration with Germany has enhanced, <ul style="list-style-type: none"> • Course content eg. sour-dough technology • Course delivery, student participation at source. • Networking eg. 20/21 Initiative • Standards

The research objectives provide the framework for the interview questions while the emerging themes outlined in table 4 arising from the research data are illustrated and evidenced below through the use of quotations from the interviews.

4.2.1 Responses to interview questions

Question 1

In the last decade has there been a change in curriculum practice at the NBS?

The objective of the first question was to establish if the interviewees experienced curriculum change. All lecturers agreed that in the last decade there has been a change in curriculum at the NBS, some expanded on the reason why, citing the following reasons:

- A) The cessation and replacement of a number of courses along with a change in course delivery and modularisation,

Yes there has been much change, the Diploma in Bakery Production and Management was replaced by new programmes including 5 professional development programmes. Bakery apprenticeship training was finalised along with the sugar craft courses. The Higher Certificate course was introduced and then phased out to be replaced with the Ordinary Degree course. Delivery methods have also changed with the introduction of baking modules. These new modules also streamlined the course to fit in with general modularisation of courses throughout the DIT. Lecturer 1

This statement is further endorsed by another lecturer,

Yes there has been much change. In 1997 a new venture was undertaken by the NBS. FAS in conjunction the NBS collaborated with the German Master Bakery School in Weinheim, Germany. This three year pilot scheme consisted of bakery apprentice students attending the NBS in block release format from their employment. The apprenticeship course ceased to exist in 2000 and yet again the NBS embraced this next level of change and introduced another suite of courses to meet the needs of industry and society and the lifelong aspirations of the student. Four new professional baking courses were introduced on a part-time basis to satisfy the gap that existed in the market. Lecturer 2

- B) Collaboration with Germany was seen as another contributor which was part of the FAS initiative.

In 1997 a new venture was undertaken by the NBS. FAS in conjunction the NBS collaborated with the German Master Bakery School in Weinheim, Germany. This three year pilot scheme consisted of bakery apprentice students attending the NBS in block release format from their employment. One of their blocks was completed on a six week course in Germany. This was the first time that industry identified the need for such training. Lecturer 2

Once it was established that there was a change in curriculum it was then necessary to establish how the curriculum had changed from the lecturers' perspectives.

Question 2

In the past decade what do you see as the main contributors to a shift in curriculum?

The responses varied to this question but there was a strong indication that bakery education, the bakery industry, a change in student profile, population diversity, a buoyant economy and a change in consumer patterns became the enforcers. The following quotations are illustrative of such contributors to change:

Changes in student profile and in population diversity led to the most recent phase of change at the NBS. Lecturer 2

Two main shifts industry itself has concentrated on factory style product but the consumer seems to desire a quality, naturally produced and fermented product. Lecturer 5

Consumerism which developed with the rise of the Celtic Tiger led to major societal change and so the bakery industry required yet another change in bakery education. Lecturer 2

Consumers have become quality reliant, travelled. Quality systems such as HACCAP have been integrated into the curriculum. Lecturer 2

Modularisation and semesterisation among others were seen by another Lecturer as a contributing factor to change,

The following have been the main contributors to change,

- a) *Discontinuation of bakery apprenticeship*
- b) *Modularisation and semesterisation*
- c) *Short-modular courses.* Lecturer 3

Lecturer 1 gives a very good overview and summarisation of the contributors to curriculum change which are as follows,

The main contributors to the shift in curriculum has been due to a number of factors including the following,

- a) *The general change in the bakery industry, less craft bakeries, and more in house baking carrying out their own in-house training.*
- b) *Lack of interest in apprenticeship.*
- c) *Decrease in general whole-time student population requiring the need to diversify and introduce the professional baking programmes and a new whole-time certificate programme.*
- d) *More interest in artisan baking and a general interest in the art of baking*
- e) *Farmers markets and the emphasis on fresh organic preservative/chemical free authentic baked products.*
- f) *A person making enquiries on how to make products themselves as it was not possible to buy such products from bakeries.*
- g) *A general revival in home baking and an interest in 'REAL' bread.*

Increased disposable income and prosperity coupled with consumers becoming travelled, conscious of quality, organic and natural produce which was difficult to obtain as the craft bakery had become almost extinct. Farmers' markets became a new phenomenon, the desire for real bread along with a revival in home-baking are some factors which have contributed enormously to a demand for part-time professional baking courses.

Question 3

Has technology and science impacted on curriculum practice?

Technology has impacted on curriculum, all agreed that it has influenced, course delivery, student learning and segregation of the bakery industry from craft to plant.

It is accepted that modern technology has transformed course delivery with the following commenting that,

The blackboard has been replaced with acetates and powerpoint presentations. Technology is embraced by students predominantly for research purposes, the use of the internet and world wide web have made information very accessible, while e-mail and chat rooms encourage communication and collaborative group work. Lecturer 2

There has been a change in the delivery of lectures from chalk and talk to power-point presentations. Lecturer 4

Each lecturer has a specialised area consequently the level of technological input to course delivery varies from a theoretical to a skills perspective with one lecturer noting that,

Technology has not impacted dramatically or influenced my teaching practices as I only teach practical classes. Lecturer 3

Technology has impacted on how students learn, it facilitates independent learning which is undertaken by students during research and case studies. Lecturer 4

Advances in technology has split the baking industry into two separate segments plant / industrial factory bakeries and craft bakeries. Lecturer 1

Modern technology is very interesting but we have actually reverted to old technology in the manufacture of products, but having said that we use modern machines and so on, but the technology of making a product has reverted back. Lecturer 5

It is worth noting that America has reverted from the use of high technology in bread-making to traditional practices while Europe never implemented high technology bread making procedures and retained its traditional and natural methods. Lecturer 3

Technology has brought about a major shift in course delivery primarily from talk and chalk to powerpoint presentations, furthermore, modern technology impacts on student learning whether it is using the world wide web or participating in a virtual learning environment. In relation to the bakery industry technology has promoted factory style bread notably in the United States in contrast to naturally produced hand crafted products of our European counterparts. Subsequently there is a reversion and rejuvenation in the art of naturally and traditionally crafted bread.

There was general agreement that science has impacted on course content particularly in the following areas, safety and hygiene, food allergens and intolerances, artisan bread, functional foods and laboratory science. Some interesting points emerged,

Scientific research is constantly releasing new facts. The merits of fortified foods are one such thing, eg. folic acid. The NBS has introduced a module on Food allergens and Functional foods this is reflective of scientific research. Lecturer 1

Students are informed of recent scientific breakthroughs such as genetically modified, fortified (folic acid/omega 3) and functional foods (soya, pro-biotic). Lecturer 2

There are ongoing scientific break-throughs which affect curriculum. The safety and hygiene module is reflective of this for example the term super-bugs are a relatively new phenomenon. Lecturer 4

There is a considerable amount of science involved in dough-making. Enzymes, bacteria and cultures are associated with the production of fermented doughs. Since the introduction of

sour-doughs students are familiarised with the scientific principles involved in this practice.
Lecturer 5

Meanwhile a very interesting point was observed which signifies that the scientific orientation of the courses has changed in the last decade.

Science has not impacted significantly on curriculum as a matter of fact there is less emphasis nowadays on organic chemistry and physics, for example students are now unfamiliar with the process of examining flour quality and the use of certain equipment such as farinographs and extensographs. Lecturer 3

This is possibly a reflection on the lack of job-opportunities now available within the milling industry. It is apparent that technology has affected course delivery and student learning while science has affected course content.

Question 4

What changes if any have been made at the NBS to facilitate a change in culture?

There was unanimous agreement that the short professional courses in conjunction with modularisation and semesterisation appeal to a broader spectrum of individuals which is reflected in the number of non-Irish students. Course content and course flexibility, transferability of ECTS along with retention of collaboration with the German Baking Academy are additional factors in facilitating a change in culture. The following quotations are supportive of this,

The introduction of the part-time professional hands on baking courses, which assists in eliminating or diminishing any language barriers. Lecturer 1

We have introduced new practical modules as part of our new degree programme for those who want to follow a definite programme. They are subject specific and have been offered out on a stand alone basis for those who cannot follow a definite programme. The uptake has been very interesting from the point of view of numbers doing those modules particularly from non-Irish approximately 10%, who are interested in what we are doing and want to improve their qualifications and knowledge of baking. Lecturer 5

Classes are now offered as full-time and part-time in modular form. Semesterisation and modularisation were introduced in 2003 at the NBS. This made education even more accessible and flexible to students now availing of third level education. Students could now take modules of the Bakery Certificate course at the most suitable time for them and gain 5 ECTS credits which would accumulate academic credits to a qualification at certificate level. The courses are tailor made to suit a diverse range of students. A clear indication of this is the hands-on approach rather than mass-production which was prevalent in the past. Travel and contact with other cultures is reflected in the current curriculum. Lecturer 2

Two lecturers were of the opinion that the NBS did not make any significant changes so as to facilitate a change in culture but went on to say that,

The NBS has not made any changes to facilitate a culture change. There was already an association with Weinheim in Germany which has promoted the students experience of continental cuisine. The courses provided by the German Baking Academy have an Irish and International orientation. Lecturer 3

The NBS has not made any changes but the courses are designed to appeal to a greater number of nationalities. Modularisation with its flexibility has attracted students of all nationalities, they have a broader European appeal as well. The NBS is cognisant of culture when designing modules. The part-time courses appeal to individuals interested in making high-class and artisan products. Lecturer 4

Despite their assertion that culture has not impacted significantly on curriculum it is evident that modularisation and semesterisation has created a broader appeal to potential students while accentuating a change in student profile. One lecturer confirms that modularisation has facilitated access for students to third level education. Meanwhile it transpired during the interviews that the hands-on approach is favoured as it appears to diminish language barriers, furthermore, the hands-on approach has taken precedence over the mass-production method at the NBS. Travel and contact with other cultures has impacted on curriculum in promoting a wider repertoire of products on the courses.

Question 5

Has economic growth impacted on curriculum development?

It emerged during the interviews that increased disposable income, food appreciation, travel, employment, immigration / job opportunities and entrepreneurship were factors derived from economic growth which impacted on curriculum development. Those factors according to most had a direct effect on curriculum development which is illustrated in the following quotations,

Yes. No question or doubt about that. Rapid expansion of the Irish economy over the last ten years has enabled people to spend more income on what might be described as luxury items which involved spending more on recreation including short food appreciation courses with cookery schools and ourselves being part of that. Lecturer 5

People are travelling extensively to foreign lands and want to replicate their holidays by purchasing similar products on their return which are not on sale. Hence the curriculum is now incorporating a vast number of foreign and international products giving the students first hand experience in the production of such items. Lecturer 3

The number of persons in labour force had rose by 17.1% from 2002 to 2006, with non-national representing 49% of the increase in employment (figures supplied by CSO principle socio-economic results Press release 2006). Present day Ireland therefore encountered the flow of extra cash, which in turn has led to an increase in spending on food products. Increased cash, concerns regarding food additives and enquiring minds led to an increase in niche food shops, health shops and farmers markets with food becoming an indicator of the nations' affluence. Due to these developments the requirement for a degree qualification in the Baking Industry has occurred. Lecturer 2

Economic growth has most definitely impacted on curriculum as the fruits of the celtic tiger were reaped many people had a greater appreciation of food in general. The open skies and cheap air fares meant more and more people travelled and with that got an appreciation of craft artisan organic products and the influx of foreign nationals also brought about change in the bakery market with these people seeking out products which were familiar to their diet hence the evolution of industry producing ethnic products. Lecturer 1

One lecturer asserted that the economy did not impact significantly on curriculum development and went on to say that,

Whole-time students are accepted through the CAO. However part-time students have more disposable income and some of the reasons cited for doing the courses are, leisure and recreation, educational, supplying farmers markets, promote health and well-being. Lecturer 4.

The overall consensus is that the economy has impacted on curriculum development. The most significant factor emerging is that economic growth has been favourable for mature and non-Irish students wanting to participate on part-time courses at the NBS and various other cooking schools. Travel, immigration, changing consumer patterns and increased spending power have contributed to the proliferation of baked food outlets such as farmers' markets, health food and ethnic food shops.

Question 6

Have consumer patterns impacted on curriculum design?

Consumer patterns have impacted on curriculum design. The following points were reflective of consumer requirements which have impacted on the current curriculum, choice and product range has expanded due to travel, prosperity, immigration. Safety and hygiene awareness has increased, quality and health conscious consumers are seeking choice and increased participation in home-baking. Those who agreed that consumer patterns impacted on curriculum design stated that,

Consumer patterns have most definitely impacted on curriculum design. Some of the following changes are reflective of this,

- a) *The introduction of sour-dough technology*
- b) *Inclusion of gluten free baking*
- c) *Individual work practices with hands on classes*
- d) *Classic cake and pastry making*
- e) *Artisan breads*
- f) *Viennoserie*

All of the above areas had to be developed for the inclusion on the courses because of general interest in the areas. Lecturer 1

Yes, as the NBS evolved it has undergone major changes to reflect changes in society, in consumer behaviour and educational requirements. The baking industry has encountered a radical change in demand for a wider choice of products, due to advances in travel, contact with other cultures and the increased mobility of people between member states of the EU. The EU opened up Ireland to a larger number of immigrants in the form of people returning to Ireland in search of work. A significant number of non-Irish entering Ireland further expanded the product range. Since 2002 figures from the CSO suggest that there has been a 2% average percentage change in the population based on religion. Such changes in population diversity led to the NBS introduction of an ordinary Degree in Baking and Pastry Arts Management in September 2007. Lecturer 2

Yes. Consumers are more quality and hygiene conscious. They are more travelled, all that combined people are looking for products in Ireland similar to those abroad. This is one reason people are taking up bakery classes. Lecturer 5

In direct contrast the remaining two lecturers did not see consumer patterns as having any significant impact on curriculum design. Lecturer 3 asserted by responding a definite no to the question while the other lecturer made the point that,

Consumers have become very health conscious, this is apparent by the number of health food shops and farmers markets providing home baked products. Lecturer 4

The findings clearly identify that Ireland has experienced a change in consumer patterns. A culture change alone has transformed consumer needs with religion being reflective of such needs, as already discussed in a previous chapter one's religion is reflective of the food consumed. Ireland already has witnessed a change in population based on religion. Consumers are cognisant of health and hygiene associated with food preparation and are becoming astute purchasers. Farmers' markets have become part of most communities in offering the consumer local, fresh, and organic produce. The NBS has responded to consumer needs by offering students a wide range of products which have international appeal and health merits.

Question 7

Has there been a change in student profile with the introduction of modularisation?

It was agreed by all that modularisation has brought about a change in student profile particularly from non CAO applicants. They all agreed that there has been change in the following areas, age, gender and nationality. The following observations were made regarding a change in student profile with the introduction of modularisation,

Student profile in the 70's were mainly male, aged 18yrs and Irish, the 1990's profile changed to females, aged 18yrs and Irish. 2000 sees a mixture of both male and female with female being the most dominant and Irish, however it saw the introduction of non-Irish. The other change in profile is the increase in numbers of mature students returned to full-time or part-time education at the NBS. Some want to upgrade their skills, seek promotion or seek a career change. Lecturer 2

The introduction of modularisation has changed the student profile as it has appealed to a broader spectrum of individuals. Modularisation offers choice enabling students to select modules that are appealing to them. Lecturer 3

15 years ago 90% of students were male and 10% female now those figures are 70% and 30%. There is a higher percentage of non-national students could not tell you the exact percentage. In the past the average age was between 17-22 now it is between 18-65. Lecturer 5

The findings reflect that the student profile at the NBS has changed significantly from the 1970's when students were mostly male, Irish and over 18 to the current trend of mature, non-Irish and mostly female students. Modularisation with its flexibility enables individuals to combine work and home with study.

Question 8

Has DIT Policy and National or European Legislation impacted on curriculum design? (Bologna Agreement 1999) and the DIT Act 1992.

The responses were very clear the two key areas everyone focused on was modularisation and quality assurance. All lecturers were very brief in their answering of this question. Some elaborated further by stating that,

We must validate courses in accordance with DIT Quality Assurance procedures. Courses were designed in modular format to meet ECT accreditation. Lecturer 1

The NBS operates within the Quality Assurance procedures and guidelines set out by the DIT. Modularisation has become an integral part of the programmes at the NBS, students acquire ECTS credits on completion of a module. Lecturer 2.

Modularisation has impacted no question or doubt about that. Taking on the Bologna Agreement the DIT took the decision that all modules run along the Bologna guidelines sometimes its good but a 3 hour lecture is a long time. We try to have back to back lectures so as to facilitate part-time students coming in. Recently in the DIT the policy on Quality Assurance is being replaced by Cost Control measures. Lecturer 5

The NBS is compliant with DIT Quality Assurance procedures and the Bologna Agreement. Modularisation was successfully implemented within the NBS in 2003. One lecturer highlights the difficulty encountered with the Bologna guidelines concerning the delivery of a three-hour lecture.

Question 9

Does staff professional development within the NBS facilitate a change in curriculum design?

Staff professional development is undertaken to maximise and facilitate curriculum evolution. The following were seen as the most significant factors, staff participation in competitions at international level, involvement in the 20/21 initiative and skills / academic professional development which impacted on course content, delivery and scholarship. It was asserted that staff professional development has had a profound impact on curriculum notably content with the introduction of the Artisan, Viennoserie and Konditorie modules. Some interesting points were made,

The curriculum has changed due to staff success in International Competitions. Three new modules (Artisan breads, Konditorie, Viennoserie) have been incorporated into the new degree programme to reflect the diversity of products developed and demonstrated at these International competitions. Lecturer 2

Most definitely, Staff have competed successfully at International level in Denmark, France, Switzerland and Germany which has been the inspiration for a number of modules on the degree programme, namely the Artisan Bread, Viennoserie and Konditorie modules. Product development has been undertaken by staff from the NBS at the International Richmond Club in Lucerne, Switzerland. Staff from the NBS were involved in the 20/21 initiative which enabled them to travel to other Bakery Educational Institutes in Austria, Germany and Holland which broadened their experience. Lecturer 3

The staff have a high International profile having been successful competing on a number of occasions abroad, and they have been invited abroad to attend some very prestigious events. Lecturer 4

Staff Professional Development can encompass a number of different aspects a number of staff are taking masters in education while others are improving skills so as to become

proficient in teaching new practical modules or programmes. We try to keep up to date.
Lecturer 5

It was mentioned by a lecturer that staff are very compliant with Staff Professional Development Programmes. It is undeniable that new modules emanated directly from staff professional development notably the Artisan Bread, Konditorie and Viennoserie modules. Staff Involvement in academic activities, skills training and International networking had implications for curriculum.

Question 10

Has collaboration between the National Bakery School and the German Baking Academy impacted on curriculum design?

There was general agreement that collaboration with the German Baking Academy has impacted on curriculum in the following manner, it has broadened the curriculum with the introduction of German baking courses, Introduced sour-dough technology, enhanced learning as it is a unique learning experience provided by masters and promotes networking with other European counter parts. The following quotations reinforces the impact of collaboration between the NBS and the German Baking Academy,

Collaboration with Germany has enabled a number of course to be provided for students from the NBS It provides students with a unique experience to travel to Germany and partake in short bread-making and cake-making courses. This is a unique experience for students as there is no overlap with the NBS. Lecturer 3

This element of the baking course has proved very popular over the years and continues to do so. The facility to travel to another country and experience the manner in which experts facilitate learning through course delivery and the production of their national products is a very welcome opportunity. New German products in conjunction with sour-dough technology have broadened the curriculum. Lecturer 2

It is widely recognised that the German people are highly organised which is reflective of the courses offered there which are very fine tuned. The courses that are offered there help to continue what we are doing. Lecturer 5

Collaboration with Germany has had a huge impact on all practical classes.
Lecturer 4.

Section Two analyses the findings from the survey conducted with participants who had the opportunity to partake on a short professional course at the Germany Baking Academy.

4.3

Section 2.

Section two examines the findings from the survey carried out to assess the learning experience of students who travelled to the German Baking Academy to complete the German Bread-making Course. A questionnaire was administered to students prior to undertaking and another on completion of the course. This allowed for the students to reflect on their hopes, aspirations, and expectations of the course beforehand while comparing, analysing and evaluating the course afterwards.

There were twelve participants on the course with only nine completing questionnaire one while all twelve completed and returned questionnaire two.

In the first questionnaire students were requested to complete six questions as follows,

Question 1

What are your feelings and expectations towards this course?

There was general agreement that it was a learning experience. Some interesting points were made by students towards the proposed course, some of which were,

- Learning Experience / Learn German bread-making techniques
- Open mindedness towards the course.
- Experience the German approach to teaching
- Hands on practical work
- Learn in a relaxed friendly atmosphere.
- Learning a new skill and passing it onto others
- Learn new recipes.

Some expressed feelings of nervousness, excitement, enthusiasm and a feeling of the unknown. Overall it was portrayed as a journey of discovery.

Question 2

Why are you participating on this course?

There were diverse answers to this question, reasons other than it being a learning experience surfaced,

- Interest in German Breads
- Experience other countries work practices
- Implement what is taught in Germany
- Improve knowledge of bread-making
- Improve skills in German bread-making

- Enjoyment “craic”
- Experience German culture
- Discover and work with new ingredients
- Confidence building exercise / opportunity to improve confidence
- Improve job opportunities
- Accredited course / gain ECTSs

Question 3

What do you hope to learn from this experience?

There was overall agreement that all participants wanted to learn and retain German bread-making techniques. Others elaborated with the following points,

- Experience the German Culture
- Experience the German baking education system
- Compare the German system with DIT
- Sour-dough techniques
- Develop German bread-making skills and bring back to Ireland.

Question 4

In your opinion what are the merits of undertaking this course?

Participants had varying ideas on the merits of the course, however most agreed on its hands-on experience, further their knowledge and promote job opportunities. Other points were made,

- Learn in a relaxed/friendly atmosphere
- Small group of students
- Examine standards
- Enhance C.V would look good on a CV
- Further learning
- German bread-making techniques are widely acknowledged
- View a selection of breads

Question 5

Has the undertaking of this course presented you with any difficulties?

Generally there were no problems reported. However cost was apparent depending on one's social status. For some cost was reported as a problem while others thought it was reasonably priced. The time-tabling of the course to coincide with the mid-term break was a bonus. It was well organised by staff of the NBS.

Question 6

Do you envisage any difficulties on this course?

Most did not envisage any difficulties but some raised the issue of,

- Language
- Unavailability / sourcing of ingredients in Ireland
- Course intensity.

This questionnaire relays any difficulties anticipated by participants.

4.4 Section 3

The following questionnaire was administered to participants on completion of the course in Germany. This questionnaire comprised of ten questions as follows,

Question 1

On completion of the course how do you feel?

On completion of the course there were similar feelings expressed to that at the onset, excitement, enthusiasm and a journey of discovery. They elaborated further by stating they were,

- Tired / Intensive with an early start from 8.30am to 5pm
- Satisfied and joyful
- Enlightened / Learned a lot
- Sad it is over / Staff there were all very helpful and friendly
- Confidence building exercise.

All participants were very satisfied with their German experience.

Question 2

Has this course been to your satisfaction?

The objective of this question was to assess if there were any inadequacies with the course. There was very positive feed back with some commenting that,

- Delighted with the gluten-free recipes
- Intensive
- Bakeries were amazing compared to the NBS
- Consider doing another course there
- Well co-ordinated

Most commented that the course was great.

Question 3

What have you learned from this experience?

There was overall agreement that they were enlightened from the experience. Everyone had learned something about the craft of German bread-making. Some commented that they had learned,

- Learned a lot about temperatures
- German culture
- Making bread using machines
- Rye and sour dough bread
- Varieties of German breads
- Enriched breads with large quantities of butter and sugar
- Sweet yeast breads and stollen

Question 4

Did you encounter any difficulties?

The overall consensus was very positive with only half expressing a difficulty with language which they maintain did not deter from the course. Some elaborated that its success was influenced by some of the following factors,

- The input from DIT staff was way above expected
- The Interpreter was excellent
- Everybody was very friendly and could not have been more helpful.

Question 5

Was there a language barrier?

The language barrier appeared to be minimal with 50% experiencing some level of difficulty while it is understood that staff there had a good standard and understanding of English while interpretation was available at all times. Some commented that there was a slight / a little difficulty. They were very accepting of this commenting that,

- A little but didn't deter from the course
- A little but that is to be expected
- Yes always is

The German language has been dropped from the curriculum, perhaps its re-introduction is something that could be looked into for the future.

Question 6

On completion of this course, what do you think are the benefits of it?

There was general agreement that the main benefit from undertaking the course was that participants would be able to make a variety of German breads. Other benefits were documented,

- Better understanding of German breads
- Seeing bread being made
- Experience German culture and spend time there
- Ability to recognise German breads in shops
- Broadened the Irish experience of breads
- Broadened their knowledge of a vast range of breads, equipment and history.
- Familiarisation with German Production systems
- Experience the German bakery education system

Question 7

Have you any recommendations or advice for students undertaking this course?

There were some interesting points made in relation to this question,

- Listen, look and learn
- Bring lots of white T-shirts and clean aprons
- Worthwhile course for someone in a bakery / pastry chef field

- Only bring flat shoes
- Bring cash because the shops/ hotel/restaurant do not like credit cards
- Go to bed early because you must start at 8.30 each morning
- Take plenty of notes especially timings
- Look, listen, practice, take it seriously!! enjoy!!
- Learn some basic German

This feedback could be very valuable for future participants. As already acknowledged previously perhaps the German language needs to be re-introduced.

Question 8

How does this bread making course compare with that at the NBS?

This was an opportunity for students to compare the German bakery education with that of the NBS. Some remarked that,

- More intense study of German Bread
- It is very different (not taking away anything from the NBS) very intense
- Good experience to make bread in machines
- Great to work in groups, not as much pressure weighing ingredients as in the NBS
- Use of different types of European flours
- Shows how to produce more commercial quantities and the machinery involved in producing same
- Different composition but equally as good

Question 9

How can this course be of benefit to you?

There was general agreement that they could produce German breads including stolen and rye breads. Meanwhile participants saw the course as presenting numerous other benefits for them. Some of which were,

- Confident in producing a German product
- New recipes and ideas incorporating seeds/nuts/different flours into bread
- Make those products as good as my European counterparts
- New knowledge
- It wants me to be a baker (far more now)
- Very good experience, fun, and educational.

- Hands-on approach to bread-making gained there
- Excellent teaching and encouragement by the Master Bakers.
- A total appreciation of the Art and Bread-making skills.
- Promote job prospects
- Help in my work environment.

Question 10

Would you recommend this course to other students?

Everyone recommended the course to others. Some commented that,

- I would tell them that the days are long but manageable. They will learn a lot and have a good time
- Definitely. I will be coming back next year
- Thoroughly worthwhile experience either as a whole-time degree student or part-time student

Students were given the opportunity to comment at the end of the questionnaire. Comments were in relation to,

- The students received their certificate on completion of the course
- The course is well designed, it demands that students participate to get as much out of the course and benefit from its teaching

4.5 Summary

It is evident from the questionnaire that all of the participants were satisfied and that the course lived up to their expectations with one participant expressing an interest in returning to complete another course there. It was an intensive hands-on approach to learning enabling the students to compare the experience and the approach with that of the NBS.

CHAPTER FIVE

Discussion of Findings

5.1 Introduction

This research set out to examine curriculum evolution at the National Bakery School over a ten year period. The study clearly demonstrated that curriculum at the NBS is dynamic and not static. In the previous chapter the main findings from the interviews and the survey were presented. The earlier literature review chapter outlined the main contributors to curriculum. Consequently the data was triangulated by the findings from the interviews, survey and the literature review. This chapter offers a summative discussion of the primary research findings in relation to the key questions of the research: what were the main curriculum changes in the last decade and what drove them? The chapter is organised to discuss external catalysts and contexts, internal drivers of curriculum change and a discussion of student insights into their experiences of the international option in the curriculum.

5.2 External Catalysts And Contexts Emanating From The Interviews Conducted.

5.2.1 Economy

There was general agreement in the outcomes of the primary research that the buoyant economy of the last decade commonly referred to as the ‘*Celtic Tiger*’ had implications for curriculum with one lecturer confirming that,

Economic growth has most definitely impacted on curriculum as the fruits of the celtic tiger were reaped many people had a greater appreciation of food in general. Lecturer 1.

Increased travel and immigration coupled with unprecedented wealth and food appreciation brought about a radical restructuring to the baked food sector, encompassing contemporary and modern trends which contributed to the success of the continuous professional short courses. Coincidentally the student profile changed with the introduction of modularisation while attracting mature and non-Irish students. The buoyant economy contributed to the very existence of the NBS mainly with the success of the short professional courses.

5.2.2 Consumerism and Media

The study clearly indicates that there is an increased interest in food and that this influenced both curriculum direction and the focus of recruitment with one Lecturer noting that,

Consumerism which developed with the rise of the Celtic Tiger led to major societal change and so the bakery industry required yet another change in bakery education. Lecturer 2.

In terms of generating consumer taste, Good Food Ireland was established in 2006 to develop and promote Ireland as a world-renowned 'Foodie' destination with food festivals and food trails in parts of the country. The findings indicate that there is clearly an interest in the food culture judging by the number and diverse range of food outlets. There are a number of apparent reasons for this phenomenon which are disposable income, travel, the increased number of Farmer's markets, ethnicity, health consciousness, increased sales of organic food promoted by An Bórd Bia, travel, cookery schools and lifestyle. The number of cookery programmes on television has increased significantly portraying food preparation as somewhat glamorous. Furthermore food writers have been scrupulous in their portrayal of food preparation and the ingenious ways in which it has been adulterated. Bread has always been associated with sustenance and life with King Henry III in 1266 placing strict controls on regarding size and price, the offending bakers faced prosecution, similarly happened in France during the revolution. There is greater demand for GI, gluten free, high fibre weight watchers and reduced salt products. Fortunately the Bakery School has been at the forefront in catering for this phenomenon with the provision and development of both the Short Professional Development Courses and the BSc in Baking and Pastry Arts Management. Interestingly it emerged during the interviews that male and female opinions differed somewhat on the notion that consumer patterns impacted on curriculum design hence it was imperative to have male and female representation so as to give a balanced picture.

5.3 Internal Contexts and Policy Strategies Emanating from The interviews Conducted.

5.3.1 Modularisation

Modularisation, encouraged by the Bologna Agreement (1999) and the NQAI, and implemented in the DIT, has contributed to a change in student profile enabling students to combine work, study and transferability. It offers students choice and flexibility by offering core and elective modules. The BSc programme is delivered in a modularised format with a number of modules being provided by the School of Hospitality and Tourism within the Faculty and the School of Retail and Services Management, part of the Faculty of Business. Shared or bridging modules are becoming increasingly popular within the DIT as it is a cost effective measure and facilitates both APL and APEL. It was apparent from the primary research that sharing modules can have a limiting effect. The following response illustrates that opinion:

Science has not impacted significantly on curriculum as a matter of fact there is less emphasis nowadays on organic chemistry and physics, for example students are now

unfamiliar with the process of examining flour quality and the use of certain equipment such as farinographs and extensographs. Lecturer 3

It is apparent that Bakery education is distinctive from culinary education and this may have implications for future cross-faculty collaboration. Laboratory science along with organic physics and chemistry were an integral part of the full-time Diploma in Bakery Production and Management course. In the past, students for example were familiar with such scientific practices as using the Chittick apparatus to determine the carbon dioxide properties of baking powder or the Henry Simon meter to determine water absorption in flour and the use of Regnault's Hygromoter to prove the significance of Boyle's Law in verifying the relationship between volume and pressure at constant temperature. In the past the milling industry was an employer of Bakery School graduates as they had the appropriate skills relevant for a position within that industry. The long-term impact of this curriculum phenomenon is as yet unknown.

5.3.2 Collaboration with The German Bakery Academy

Collaboration with Germany was the propellant for the NBS to network with other European Bakery Education counter-parts. It has promoted staff professional development and endorsed further education for students which is reinforced by a Lecturer who states that,

Collaboration between the NBS and Germany has impacted on the curriculum design because of the inclusion of three courses offered by the NBS in Germany again this has been because of demand from students wanting to understand the industry and engaging in education with the masters. Lecturer 1

Collaboration with Germany has contributed immensely to curriculum in relation to course content with one Lecturer confirming that, '*Collaboration with Germany has had a huge impact on all practical classes*'. Lecturer 4. Meanwhile, most practical modules have a German influence with sour-dough technology having the most significant impact in bread-making during the production of such breads as, Holzfallerbrot, Weizenmishbrot and Grahambrot. The cake module covers German Festive Baking at Christmas with the inclusion of biscuits and Lebkuchken. Full-time students complete the Konditorie module which gives them an insight into German classical cake-making.

5.3.3 Curriculum Content

This study indicates that continuous staff professional development has been the catalyst for the introduction of the Viennoserie, Konditorie, and Artisan Technology modules. This has been achieved mainly by staff at the NBS successfully competing at International level and ongoing collaboration with the German Baking Academy. Those modules have international student appeal which has coincided with a change in student profile mainly with the number of non-Irish participants. Ten years ago the Irish consumer would have found it difficult to

acquire German Konditorie or German tortes and desserts or Viennoserie which involves classical French laminated and non-laminated sweet dough production and Artisan and artistic bread products. Although still in its infancy German konditorie products and German breads are gaining popularity. Two well known German bakeries are George's Bakery, Slane, Co.Meath and Unglert's Bakery in Ennistymon, Co. Clare while il Valentino in Dublin is gaining popularity with its Italian and continental breads.

5.3.4 Professional Development Opportunities for Academic Staff

The findings indicate that staff of the NBS are focused and conscious of curriculum change with staff engaged in various activities, *'All of the staff are engaged in professional development to meet the demands of curriculum change'* responded Lecturer 1. Staff Professional Development encompasses a variety of activities pertaining to curriculum change at the Bakery School whether it is skills development, academic or scholarly activities according to one Lecturer,

Staff Professional Development can encompass a number of different aspects a number of staff are taking masters in education while others are improving skills so as to become proficient in teaching new practical modules or programmes. We try to keep up to date. Lecturer 5

Staff at the NBS are conscious of promoting its public persona at local and international level,

The staff have a high International profile having been successful competing on a number of occasions abroad, and they have been invited abroad to attend some very prestigious events. Lecturer 4.

Staff involvement in the 20/21 initiative contributed to product development, student learning, and course delivery. The following statement summarises the success of this initiative,

The 20/21 initiative followed collaboration with Germany. Holland was instrumental in this programme bringing together bakery education institutes from Switzerland, Germany, Austria and eventually Ireland. It involved student and staff exchanges throughout European. Students were involved in 6 week exchange programmes while staff were involved in product development. It gave them the opportunity to see what was going on in Europe, it was an eye opener. Lecturer 5.

The study indicates that Continuous Staff Professional Development had a major role in curriculum evolution. It has shaped course content and delivery and has played a pivotal role in curriculum planning. Furthermore staff exposure on the international platform has extended the profile of the NBS abroad.

5.3.5 Gaps in the Curriculum

This study has clearly indicated that in the last decade there was a major restructuring of the bakery industry and that there is a strong tendency to revert to a contemporary approach of bread-making which is reflected in the curriculum at the NBS. Modern technology having been described as being interesting does not feature as strongly on the current curriculum.

America has reverted from the use of high technology in bread-making to traditional practices while Europe never implemented high technology bread making procedures and retained its traditional and natural methods. Lecturer 3

As previously mentioned the Chorleywood Bread-making Process in recent times has been met with adversity. In 2000 the introduction of the short professional courses brought about a hands-on approach with commercial bakery equipment almost becoming obsolete at the NBS. Currently there is no module on Bakery Engineering. In the past bakery engineering featured strongly on the whole-time Bakery Production and Management course, students were familiar with the use and workings of commercial bakery equipment to the extent of knowing and understanding the revolutions per minute of a mixer.

5.3.6 The Appliance of Science

It is clear from the research that science has impacted on curriculum design at the Bakery School with the following response from Lecturer 1 '*Scientific research is constantly releasing new facts*'. In the last ten years research has shown the benefits of fish oils, low salt and low sugar along with added vitamins and minerals in the diet.

Students are given the opportunity to produce a range of products which cater for a range of conditions for example, science has proven that oats has a cholesterol reducing property this is indicative of its incorporation into baked products.
Lecturer 2.

Furthermore more is known of food intolerance and food allergens commonly wheat, nuts and dairy products. This has been filtered down to bakery education with the introduction of the Functional Food and Food Allergen module with Lecturer 2 noting that the *Functional Food and Food Allergen module on the degree programme originated from scientific research*. This module enables students to develop an understanding of functional foods and food allergens related to ingredients used in the bakery and general food and the food service industry. Students are familiarised with the distinction between functional, fortified and super foods. As part of the module students develop a range of products for special diets such as coeliac, diabetic, glycaemic index (GI) and cardio vascular. The NBS is at the forefront in educating its students to develop new and innovative products for such a market. One such student is Denise O'Callaghan former financier turned artisan baker has founded Ireland's only Coeliac Artisan Bakery 'Delicious' in Cork. Another development at the NBS is the

production of spelt bread. It is becoming increasingly popular with O'Sullivan's Bakery in Kerry launching a wide range of spelt products which are considered to promote good health and well-being.

5.3.7 Health, Safety and Hygiene Matters

Just as science research has inspired the Functional Food and Intolerance module so too has it contributed to course content on the Safety and Hygiene module. In the last decade Ireland has been confronted with Public Health issues such as water contamination and the increase in fatalities presented by inadequate Hospital Hygiene systems. Consequently science has impacted on safety and hygiene with the emergence of new strains of bacteria with one Lecturer 4 mentioning that '*super-bugs*' are a relatively new phenomenon. Previously students were familiar with common bacteria such as Salmonella, Clostridium Botulism, Staphylococcus and E-coli, unknown at the time were super bugs and Methicillin-Resistant Staphylococcus Aureus (MRSA). As well as Health and Hygiene students are acquainted with relevant Government Legislation and Quality Assurance practices such as hazard analysis critical control point (HACCP). *Quality systems such as HACCAP have been integrated into the curriculum.* Lecturer 2

5.3.8 Pedagogy Matters

Technology has not impacted significantly on course content but has hugely influenced course delivery. Staff are proficient in the use of IT equipment which has impacted on course delivery and student learning, most significantly in the area of research and case study activities. There has been a move from chalk and talk to electronic presentations with Lecturer 2 noting that, '*The blackboard has been replaced with acetates and powerpoint presentation*'. However, it is worth noting that technology has not influenced practical teaching and practical course delivery to the same extent, '*Technology has not impacted significantly on practical classes but to a greater extent regarding theory classes*', Lecturer 2. This statement is further endorsed by another lecturer who reinforces that, '*Technology has not impacted dramatically or influenced my teaching practices as I only teach practical classes*', Lecturer 3.

There is a strong indication that technology in relation to bakery practice has diminished. Lecturer 1, when asked if technology had impacted on curriculum practice, stated that: '*Advances in technology has split the baking industry into two separate segments plant / industrial factory bakeries and craft bakeries*'. This statement is further reinforced by Lecturer 3, who stated that '*America has reverted from the use of high technology in bread-making to traditional practices while Europe never implemented high technology bread making*'.

procedures and retained its traditional and natural methods', Consequently there is a reversion from mass produced to artisan or craft-baking which is echoed by Lecturer 5,

Modern technology is very interesting but we have actually reverted to old technology in the manufacture of products, but having said that we use modern machines and so on, but the technology of making a product has reverted back.

Technology has impacted on course delivery at the NBS but technology *per se* has not influenced its course content significantly. Liam Fitzpatrick a former student of the NBS is innovative in bringing about the first on-line bread-making course designed for Irish Emigrants. Presently it is difficult to confirm its success or to speculate its future success but it could have significance for practical bakery education.

5.3.9 Cultural Diversity and Multi-ethnicity

In relation to culture there is as much ambiguity with the interviewees as with writers on the subject of culture and curriculum. However, the study demonstrates that the population of Ireland in the twenty first century is quite different from that of the twentieth century. Taste is intrinsically linked to culture and as already outlined in Chapter Two bread symbolises a country's cuisine denoting its geography, climate, religion, customs and culture. Cultural diversity has brought about changes in bakery and food entrepreneurship with an increase in the number of German, Polish, Russian and Italian baked food outlets emerging throughout the country. The following quotation reinforces this sentiment,

The influx of foreign nationals also brought about change in the bakery market with these people seeking out products which were familiar to their diet hence the evolution of industry producing ethnic products. Some of these migrant workers saw a gap in the market themselves and a number of Polish and others opening their own bakeries and are appearing at markets. Lecturer 1.

The NBS is progressive in meeting the challenge of population diversity. Viennoserie, Konditorie, and Artisan Modules are indicative of the nation's affluence and multi-nationalism. It was un-envisaged ten years ago such products would be on the curriculum. Those modules have International appeal which is reflective of modern day Ireland. The findings reflect that the hands-on courses at the NBS assist in eliminating any language barrier as the course uptake is highly representative of non-Irish students.

5.4.1 Section Two: Discussion Of Student Insights Emanating From The Survey.

5.41 The German bread-making experience

The survey carried out with students participating on the professional German Bread-making course was very worthwhile. It gave the students an opportunity to compare the standards, diversity and the quality of products with that of the Bakery School. It enabled them to experience course delivery within a world renowned state of the art facility.

The first questionnaire established the students' expectations, feelings and fears of participating on the course. The participants were extremely satisfied with the input provided by staff from the Bakery School in making their trip worthwhile. However in relation to the findings it could be observed that the following be looked at for the future success of the programme,

- Induction programme, an over-view of German courses could be beneficial
- Short German Language Course
- Funding / Sponsorship for full-time students.

The second questionnaire analysed the students' experience. It proved to be a very valuable learning experience as students adapted to a new learning environment, materials and products along with adapting to a new culture. It promoted their knowledge of sour-dough technology as it featured strongly on the course. Learning was facilitated and promoted by hands-on participation, observation, note taking and handouts. The bakery industry has a long and traditional history, interestingly participants want to pass on the craft to future generations. The Dublin Bakers Guild was established in 1483. It can be noted from this questionnaire that this course has broad audience appeal. This study was worthwhile as some very practical recommendations emerged which may seem trivial but for future participants could be of major significance.

CHAPTER SIX

Conclusions and Recommendations

6.1 Introduction

The original aim of this research was broadly to evaluate curriculum change at the National Bakery School (NBS) in the decade from 1998-2008 by exploring the contributory contextual and causal factors. The contexts and causes were explored in relation to ten research questions during the course of the study, as detailed in Chapter One and as summarised in this chapter. New data to illuminate the questions were collected through interviews with academic staff of the School and through surveys with current students. Additionally, relevant documents were interrogated for evidence which would indicate causes and processes of curriculum change. This data was presented in the chapters dealing with context and background literature, as well as in the directly previous chapter where data from the interviews and student surveys was presented.

6.2 Summary of the research questions

This current chapter draws the data into an analytical summary in relation to the ten research questions by way of research conclusions, and then makes recommendations arising from the data to the Bakery School, to future students.

Question 1

Has technology and science impacted on curriculum practice?

Technology has impacted on course delivery and student learning while technology in bread-making has diminished.

Science has contributed to course content primarily in the area of Health and Hygiene and the Functional Ingredient and Allergen Module.

Question 2

Have consumer patterns impacted on curriculum design?

Consumer patterns have impacted on course content with hands-on practical classes which cater for those who seek luxury, ethnic, organic, healthy and quality options. This has coincided with a change in student profile and is reflective of the increase in farmers' markets.

Question 3.

Has a culture change impacted on curriculum?

Modularisation has appealed to non-Irish students which is reflected in the number of participants, furthermore the BSc syllabus has a strong International ethos and broad appeal with the introduction of the Viennoserie, Konditorie and Artisan, Modules.

Question 4

Has economic growth impacted on curriculum development?

Travel, time, increased disposable income, food appreciation, health consciousness, immigration, and employment have contributed to the demand for part-time professional baking courses. The emergence of boutique style bakeries and the number of farmers' markets is reflective of this trend.

Question 5

Has there been a change in student profile?

There were no exact figures to hand but during the course of the interviews it emerged that modularisation has brought about a change in student profile. There has been an increase in mature, non-Irish and female students participating in bakery education at the NBS.

Question 6

Has National and European Legislation impacted on curriculum design? eg. (Bologna Agreement 1999) and the DIT Act 1992.

Modularisation has been implemented in conjunction with the Bologna Agreement. Modularisation facilitates ECTS. The NBS has a duty to comply with the DIT Quality Assurance procedures and guidelines.

Question 7

Has staff professional development impacted on curriculum change at the NBS?

Staff professional development both in skill and academic orientation has contributed significantly to course content and delivery which is in keeping with the DIT's Professional Development Programme (PDP)

Question 8

Explain how DIT policy has influenced curriculum change?

The Institute's Mission Statement outlines its role in the provision of education which is inclusive of teaching, research and consultancy. The Quality Assurance system within the DIT maintains and improves the academic standards and the provision of education within the institute. In 2003 the implementation of modularisation within the Institute has standardised its practices within International practices. International Partnership by means of external examiners and student or staff exchange programmes has promoted teaching and learning. Implementation of the NFQ's has standardised the Institute's programmes and brought them into line with other third level providers of education.

Question 9

Has collaboration between the National Bakery School and the German Baking Academy impacted on curriculum design?

Collaboration between the two Bakery Education Institutes has impacted on curriculum design primarily in the area of sour-dough technology. It offers students a number of courses

in bread and cake making while recently chocolate and ice-cream making course have been offered to voluntary participants, thus experiencing another culture and its delivery of bakery education.

Question 10

Has modularisation impacted on curriculum change?

Modularisation has contributed to a change in student profile, student numbers, course content, delivery, and assessment.

6.3 The Relevance of the Study

This research study has some significance for the Bakery School, particularly on four levels.

Firstly, the study traces the history of bakery education in Dublin and clearly documents the dynamics of curriculum evolution at the School since its origins. This type of study has not been completed heretofore.

Secondly, the study could be relevant to past, present and future students, academics and scholars as it is the only research that has ever been carried out on curriculum evolution at the NBS. While this is mainly a narrative dimension it also illustrates the processes and catalysts which cause curriculum change to happen. In this sense the study has transferability to other context in terms of analysis of curriculum change and in terms of responsiveness to changing context and external factors.

Thirdly, the study illustrates how modularisation had unexpected consequences for curricula in the School in so much as it offered opportunities to respond very quickly to changing consumer and market needs in its approach to the use of modularisation for CPD courses and development of small enterprises. This finding alone is of significance to other Schools and programmes.

Finally, it portrays the gaps in the knowledge between bakery education, the bakery industry and the significance of the milling industry in the past on contemporary bakery education. This findings may be of significance on the macro level of food security generally and the availability of bread in particularly in the context of commodity supply, demand and futures trading globally.

6.4 Recommendations

The research findings lead to the generation of a number of practical recommendations to key stakeholders such as The Bakery School, and to future students as outlined below.

6.4.1 Recommendations to the National Bakery School

Recommendation 1:

Train bakery students to be successful at European and international competitions to enhance their knowledge and future professional prospects. To date only staff have competed in competitions which has proved very successful which could be very beneficial for students.

Recommendation 2:

Recognise the effort of staff in organisation, managing and evaluation international student experiences with appropriate rewards. Input from staff does not receive any recognition.

Recommendation 3:

Recognise the effort and achievements of staff who compete at national and international levels. Staff achievements' at International level does not merit any recognition.

Recommendation 4:

Increase the profile of the only Bakery Education Institute in Ireland through successful participation in competitions. Maintaining the international profile of the NBS is imperative to its future success.

Recommendation 5:

Generate research funding to test new products through the product development module.

Recommendation 6:

Consider a suitable medium to disseminate the NBS's quite substantial collection of unpublished papers particularly in relation to the history of baked products. Many of the unpublished papers within the NBS could be a source of referencing for students and staff.

Recommendation 7:

Build on the existing collaboration between the NBS and the German Baking Academy though other International or European partnerships from a placement and education perspective. This initiative has proved to be very successful and needs to be maintained and retained

Recommendation 8:

In relation to the German bread-making course, include the following:

- An Induction Programme
- German Language Training
- Funding / Sponsorship for whole-time students.

Recommendation 9:

In relation to cereal research and analysis, re-introduce a specific module in this regard. Module sharing has contributed to de-scaling of subject content.

Recommendation 10:

In relation to food security, consider a CPD programme in relation to the environmental perspective: climate change and global warming in relation to growing conditions in high grain-producing countries and yield reduction and biodiversity fuels as these scenarios will impact significantly on the bakery industry and bakery education in the future.

Recommendation 11:

Strengthen the languages elements of the programmes.

Recommendation 12:

Continuous professional development contributes to curriculum development, consequently it is imperative that investment in training and development is sustained and that cost cutting measures do not precede quality.

Recommendation 13:

Cap the cost of part-time courses so as to encourage student participation of part-time students.

Recommendation 14:

Award ECTS credits as an option in recognition of International and European participation whether it is of a skills or academic nature.

Recommendation 15:

Build a rapport with the small bakery enterprises, food and artisan producers that have emerged in the last number of years as they will be a major contributor of employment to future bakery students.

6.4.2 Recommendations to Future Students

Recommendation 1:

Take every opportunity for the acquisition of other languages. The survey carried out indicated the importance of a language, in this case German.

Recommendation 2:

Participate in national and international competitions to enhance learning and profile. To date staff competing at international level, for them the merit was input to the development of new modules.

Recommendation 3

If possible avail of the Opportunity to participate on the German Courses. Participants on the German bread-making course have outlined the benefits of undertaking such a course.

6.5 Endnote

This research sought answers to ten research questions in relation to curriculum change in the Bakery School. Broadly, the data supplied that response to a satisfactory degree. What also emerged were findings that were transferrable to other professional/occupational sectors and their curriculum challenges in a rapidly changing economic and consumer world. Those findings include the need to understand the context of change, the factors that are key catalysts and the effective response to them through strong and effective academic leadership. As an insider-researcher, my perspective is inevitably subjective and the study on that impacts on my professional identity. Therefore, the research speaks to other academics who find themselves embodied in a rapid curriculum change process; essentially this thesis was living practice and will resonate with colleagues in similar context and similar reflective spaces.

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APPENDIX A

Interview One

Question 1

In the last decade has there been a change in curriculum practice at the NBS?

Yes there has been much change, the Diploma in Bakery Production and Management was replaced by new programmes including 5 professional development programmes. Bakery apprenticeship training was finalised along with the sugar craft courses. The Higher Certificate course was introduced and then phased out to be replaced with the Ordinary Degree course. Delivery methods have also changed with the introduction of baking modules. These new modules also streamlined the course to fit in with general modularisation of courses throughout the DIT.

Question 2

In the past decade what do you see as the main contributors to a shift in curriculum?

The main contributors to the shift in curriculum has been due to a number of factors including the following

- h) The general change in the bakery industry, less craft bakeries, and more in house baking carrying out their own in-house training.
- i) Lack of interest in apprenticeship.
- j) Decrease in general whole-time student population requiring the need to diversify and introduce the professional baking programmes and a new whole-time certificate programme.
- k) More interest in artisan baking and a general interest in the art of baking
- l) Farmers markets and the emphasis on fresh organic preservative/chemical free authentic baked products.
- m) A person making enquiries on how to make products themselves as it was not possible to buy such products from bakeries.
- n) A general revival in home baking and an interest in 'REAL' bread.

Question 3

Has technology and science impacted on curriculum practice?

Not really because we have gone back to the beginning! The understanding of baking technology has meant that it is a fundamental subject area to make the professional baking courses more worthwhile. Baking technology is offered for CPD. Advances in technology has split the baking industry into two separate segments plant / industrial factory bakeries and craft bakeries. Scientific research is constantly releasing new facts. The merits of fortified foods are one such thing, eg. folic acid. The NBS has introduced a module on Food allergens and Functional foods this is reflective of scientific research.

Question 4

What changes if any have been made at the NBS to facilitate a change in culture?

Many changes language barriers. have been made as mentioned before the most significant has been the introduction of the part-time professional hands on baking courses, which assists in eliminating or diminishing any.

Question 5

Has economic growth impacted on curriculum development?

Economic growth has most definitely impacted on curriculum as the fruits of the celtic tiger were reaped many people had a greater appreciation of food in general. The open skies and cheap air fares meant more and more people travelled and with that got an appreciation of craft artisan organic products and the influx of foreign nationals also brought about change in the bakery market with these people seeking out products which were familiar to their diet hence the evolution of industry producing ethnic products. Some of these migrant workers saw a gap in the market themselves and a number of Polish and others opening their own bakeries and appearing at markets. People are more affluent and

are willing to pay more for quality products. Those quality products were difficult to come by and the consumer was also recognising the range of quality products being produced and readily available all over Europe in the many cities people were visiting and wanted to get similar products in Ireland. Some recognised the gap in the market and began to produce quality small scale products for markets, coffee shops and delis. As their businesses grew and people wanted to learn more about the art of baking a demand in courses was sought with the National Bakery School being looked at as being the ideal place to do such a course, hence the huge success of these courses.

Question 6

Have consumer patterns impacted on curriculum design?

Consumer patterns have most definitely impacted on curriculum design. Some of the following changes are reflective of this,

- a) The introduction of sour-dough technology
- b) Inclusion of gluten free baking
- c) Individual work practices with hands on classes
- d) Classic cake and pastry making
- e) Artisan breads
- f) Viennoserie

All of the above areas had to be developed for the inclusion on the courses because of general interest in the areas.

Question 7

Has there been a change in student profile with the introduction of modularisation?

Student profile has changed significantly. There are regular whole time students consisting of school leaving students and mature students. Part-time mature students over 23. There are no longer any apprentices whom were aged from 16 upwards. All our student profiles are 18 upwards.

Question 8

Has DIT Policy and National or European Legislation impacted on curriculum design? (Bologna Agreement 1999) and the DIT Act 1992.

Yes as we must validate courses in accordance with DIT Quality Assurance procedures. Courses were designed in modular format to meet ECT accreditation.

Question 9

Does staff professional development within the NBS facilitate a change in curriculum design?

Staff professional development does facilitate curriculum change as all of the staff are engaged in professional development to meet the demands of curriculum change.

Question 10

Has collaboration between the National Bakery School and the German Baking Academy impacted on curriculum design?

Collaboration between the NBS and Germany has impacted on the curriculum design because of the inclusion of three courses offered by the NBS in Germany again this has been because of demand from students wanting to understand the industry and engaging in education with the masters.

Interview Two

Question 1

In the last decade has there been a change in curriculum practice at the NBS?

Yes there has been much change. In 1997 a new venture was undertaken by the NBS. FAS in conjunction the NBS collaborated with the German Master Bakery School in Weinheim, Germany. This three year pilot scheme consisted of bakery apprentice students attending the NBS in block release format from their employment. One of their blocks was completed on a six week course in Germany.

This was the first time that industry identified the need for such training. As I already stated it was introduced as a pilot scheme and didn't begin a second cohort at the end of its term due to the fact that the bakery industry requirements were changing and the number of bakeries employing apprentices was declining.

The apprenticeship course ceased to exist in 2000 and yet again the NBS embraced this next level of change and introduced another suite of courses to meet the needs of industry and society and the lifelong aspirations of the student. Four new professional baking courses were introduced on a part-time basis to satisfy the gap that existed in the market. These courses were of twelve week duration, consisting of one class per week and were designed to fit in with the fast paced lives of professionals. In this hectic lifestyle, people wishing to learn the art of baking can commit to short courses rather than engage in long term training and it was with this in mind that the format on course delivery was agreed. These courses are still as popular today with some students waiting one year to gain entry. One element of these revolutionary courses was the incorporation of baking modules at the German Baking Academy. Ties formed during the former years with the German School were maintained and a module was offered to students enabling them to attend Master Bakery classes in Germany the international bakery element of their training.

The DIT welcomed yet change occurring in the education of students and introduced semestrisation and modularisation in 2003 at the NBS. This made education even more accessible and flexible to the students now availing of third level education. Students could now take modules of the Bakery Certificate at the most suitable time for them and gain 5 ECTS credits which would accumulate academic credits to a qualification at certificate level. A new ordinary degree in Baking and Pastry Arts commenced in 2007.

Question 2

In the past decade what do you see as the main contributors to a shift in curriculum?

Changes in student profile and in population diversity led to the most recent phase of change at the NBS.

The need for this new degree emanated from two phenomenons. The first phenomenon was due to the discerning palette of Irish society. Consumerism which developed with the rise of the Celtic Tiger led to major societal change and so the bakery industry required yet another change in bakery education. The number of persons in labour force had rose by 17.1% from 2002 to 2006, with non-national representing 49% of the increase in employment. Present day Ireland therefore encountered the flow of extra cash, which in turn has led to an increase in spending on food products. Increased cash, concerns regarding food additives and enquiring minds led to an increase in niche food shops, health shops and farmers markets with food becoming an indicator of the nations' affluence. Consumers have become quality reliant, travelled. Quality systems such as HACCAP have been integrated into the curriculum. The increase in the number of farmers markets throughout the country to 115 indicates the interest now present in organic and home grown food.

Question 3

Has technology and science impacted on curriculum practice?

Technology has not impacted significantly on practical classes but to a greater extent regarding theory classes. Technology has impacted on curriculum practice through changes in course delivery. Staff are trained in various methods of course delivery and trained to understand the manner in which students learn and process information. The blackboard has been replaced with acetates and powerpoint presentations. Technology is embraced by students predominantly for research purposes, the use of the internet and world wide web have made information very accessible, while e-mail and chat rooms encourage communication and collaborative group work.

Scientific research is unfolding causes and effects of food intolerances and allergens which were not as prevalent in the past. Hence science has impacted on course design as the Functional Food and Food Allergen module on the degree programme originated from scientific research. Students are informed of recent scientific breakthroughs such as genetically modified, fortified with folic acid and omega 3 and functional foods such as soya, pro-biotic. The relationship between health and food is also identified with students being familiarised with the GI diet, coeliac, diabetic and heart related conditions. Students are given the opportunity to produce a range of products which cater for a range of conditions for example, science has proven that oats has a cholesterol reducing property this is indicative of its incorporation into baked products.

Question 4

What changes if any have been made at the NBS to facilitate a change in culture?

Classes are now offered as full-time and part-time in modular form. Semesterisation and modularisation were introduced in 2003 at the NBS. This made education even more accessible and flexible to students now availing of third level education. Students could now take modules of the Bakery Certificate course at the most suitable time for them and gain 5 ECTS credits which would accumulate academic credits to a qualification at certificate level. The courses are tailor made to suit a diverse range of students. A clear indication of this is the hands-on approach rather than mass-production which was prevalent in the past. Travel and contact with other cultures is reflected in the current curriculum.

Question 5

Has economic growth impacted on curriculum development?

Yes economic growth has impacted on curriculum. In addition to the expanding and diverse workforce, the phenomenon of consumerism developed with the rise of the Celtic Tiger leading to major societal change. The number of persons in labour force had rose by 17.1% from 2002 to 2006, with non-national representing 49% of the increase in employment. Present day Ireland therefore encountered the flow of extra cash, which in turn has led to an increase in spending on food products. Increased cash, concerns regarding food additives and enquiring minds led to an increase in niche food shops, health shops and farmers markets with food becoming an indicator of the nations' affluence. Due to these developments the requirement for a degree qualification in the Baking Industry has occurred.

Question 6

Have consumer patterns impacted on curriculum design?

Yes, as the NBS evolved it has undergone major changes to reflect changes in society, in consumer behaviour and educational requirements. The baking industry has encountered a radical change in demand for a wider choice of products, due to advances in travel, contact with other cultures and the increased mobility of people between member states of the EU. The EU opened up Ireland to a larger number of immigrants in the form of people returning to Ireland in search of work. A significant number of non-Irish entering Ireland further expanded the product range. Since 2002 figures from the CSO suggest that there has been a 2% average percentage change in the population based on religion. Such changes in population diversity led to the NBS introduction of an ordinary Degree in Baking and Pastry Arts Management in September 2007.

Question 7

Has there been a change in student profile with the introduction of modularisation?

Student profile in the 70's were mainly male, aged 18yrs and Irish, the 1990's profile changed to females, aged 18yrs and Irish. 2000 sees a mixture of both male and female with female being the most dominant and Irish, however it saw the introduction of non-Irish. The other change in profile is the increase in numbers of mature students returned to full-time or part-time education at the NBS. Some want to upgrade their skills, seek promotion or seek a career change.

Question 8

Has DIT Policy and National or European Legislation impacted on curriculum design? (Bologna Agreement 1999) and the DIT Act 1992.

Yes. The NBS operates within the Quality Assurance procedures and guidelines set out by the DIT. Modularisation has become an integral part of the programmes at the NBS, students acquire ECTS credits on completion of a module

Question 9

Does staff professional development within the NBS facilitate a change in curriculum design?

Yes. The curriculum has changed due to staff success in International Competitions. Three new modules (Artisan breads, Konditorie, Vienoiserie) have been incorporated into the new degree

programme to reflect the diversity of products developed and demonstrated at these International competitions. These new products are proving very popular with students.

Question 10

Has collaboration between the National Bakery School and the German Baking Academy impacted on curriculum design?

Yes. This element of the baking course has proved very popular over the years and continues to do so. The facility to travel to another country and experience the manner in which experts facilitate learning through course delivery and the production of their national products is a very welcome opportunity. New German products in conjunction with sour-dough technology have broadened the curriculum.

Interview Three 01/04/082.15-3.00 pm

Question 1

In the last decade has there been a change in curriculum practice at the NBS?

Yes there has been significant change at the NBS in the last ten years

Question 2

In the past decade what do you see as the main contributors to a shift in curriculum?

The following have been the main contributors to change,

- d) Discontinuation of bakery apprenticeship
- e) Modularisation and semesterisation
- f) Short-modular courses.

Question 3

Has technology and science impacted on curriculum practice?

Technology has not impacted dramatically or influenced my teaching practices as I only teach practical classes. It is worth noting that America has reverted from the use of high technology in bread-making to traditional practices while Europe never implemented high technology bread making procedures and retained its traditional and natural methods. However there has been a change in the delivery of lectures from chalk and talk to power-point presentations.

Science has not impacted significantly on curriculum as a matter of fact there is less emphasis nowadays on organic chemistry and physics, for example students are now unfamiliar with the process of examining flour quality and the use of certain equipment such as farinographs and extensographs.

Question 4

What changes if any have been made at the NBS to facilitate a change in culture?

The NBS has not made any changes to facilitate a culture change. There was already an association with Weinheim in Germany which has promoted the students experience of continental cuisine. The courses provided by the German Baking Academy have an Irish and International orientation.

Question 5

Has economic growth impacted on curriculum development?

Yes. People are travelling extensively to foreign lands and want to replicate their holidays by purchasing similar products on their return which are not on sale. Hence the curriculum is now incorporating a vast number of foreign and international products giving the students firsthand experience in the production of such items.

Question 6

Have consumer patterns impacted on curriculum design?

No

Question 7

Has there been a change in student profile with the introduction of modularisation?

Yes. The introduction of modularisation has changed the student profile as it has appealed to a broader spectrum of individuals. Modularisation offers choice enabling students to select modules that are appealing to them.

Question 8

Has DIT Policy and National or European Legislation impacted on curriculum design? (Bologna Agreement 1999) and the DIT Act 1992?

Yes. The NBS implements the Quality Assurance procedures under the directive of the DIT. Each module enables a student acquire 5 ECTS credits.

Question 9

Does staff professional development within the NBS facilitate a change in curriculum design?

Most definitely, Staff have competed successfully at International level in Denmark, France, Switzerland and Germany which has been the inspiration for a number of modules on the degree programme, namely the Artisan Bread, Viennoiserie and Kinditorie modules. Product development has been undertaken by staff from the NBS at the International Richmond Club in Lucerne, Switzerland. Staff from the NBS were involve in the 20/21 initiative which enabled them to travel to other Bakery Educational Institutes in Austria, Germany and Holland which broadened their experience.

Question 10 .

Has collaboration between the National Bakery School and the German Baking Academy impacted on curriculum design?

Yes, Collaboration with Germany has enabled two course to be provided. It provides students with a unique experience to travel to Germany and partake in short bread-making and cake-making courses. This is a unique experience for students as there is no overlap with the NBS.

Interview Four

Question 1

In the last decade has there been a change in curriculum practice at the NBS?

Yes.

Question 2

In the past decade what do you see as the main contributors to a shift in curriculum?

The main factors which have contributed to a shift in curriculum are,

- The demise of the bakery apprenticeship course
- The demise of the diploma course
- The introduction of the Higher Certificate course
- Semesterisation and modularisation
- The introduction of the part-time courses.

Question 3

Has technology and science impacted on curriculum practice?

Technology has not impacted significantly on practical classes. Theory classes keep abreast with technology advancement. All aspects of technology advancement is covered on full-time courses. Significant technological advancement in bread production which occurs in large scale bread production is covered. Technology has impacted on how students learn, it facilitates independent learning which is undertaken by students during research and case studies. Technology has also affected teaching, handouts and power-point presentations have replaced chalk and talk.

There are ongoing scientific break-throughs which affect curriculum. The functional food and safety and hygiene modules are reflective of this, for example the term super-bugs are a relatively new phenomenon which has implications for curriculum content.

Question 4

What changes if any have been made at the NBS to facilitate a change in culture?

The NBS has not made any changes but the courses are designed to appeal to a greater number of nationalities. Modularisation with its flexibility has attracted students of all nationalities, they have a broader European appeal as well. The NBS is cognisant of culture when designing modules. The part-time courses appeal to individuals interested in making high-class and artisan products.

Question 5

Has economic growth impacted on curriculum development?

Not significantly. As whole-time students are accepted through the CAO. However part-time students have more disposable income and some of the reasons cited for doing the courses are, leisure and recreation, educational, supply farmers markets, promote health and well-being.

Question 6

Have consumer patterns impacted on curriculum design?

Not significantly, although consumers have become very health conscious, this is apparent by the number of farmers markets.

Question 7

Has there been a change in student profile with the introduction of modularisation?

Yes. Applicants from the CAO are aged between 19-22, the part-time courses appeal to a different age group generally mature students. The introduction of modularisation has increased the number of part-time mature students and foreign nationals.

Question 8

Has DIT Policy and National or European Legislation impacted on curriculum design? (Bologna Agreement 1999) and the DIT Act 1992?

The NBS facilitates all DIT practices.

Question 9

Does staff professional development within the NBS facilitate a change in curriculum design?

Yes. Staff are compliant with Continuous Professional Development Programmes. The NBS is a small department and currently has three members undertaking Master Programmes which is reflective of the dedication they have towards continuous professional development. The staff have a high International profile having been successful competing on a number of occasions abroad, and they have been invited abroad to attend some very prestigious events.

Question 10

Has collaboration between the National Bakery School and the German Baking Academy impacted on curriculum design?

Collaboration with Germany has had a huge impact on all practical classes.. Students have the option to partake

Interview Five**Question 1**

In the last decade has there been a change in curriculum practice at the NBS?

Yes there has, we have made a number of changes.

Question 2

In the past decade what do you see as the main contributors to a shift in curriculum?

Yes. Two main shifts industry itself has concentrated on factory style product but the consumer seems to desire a quality, naturally produced and fermented product.

Question 3

Has technology and science impacted on curriculum practice?

Not really, modern technology is very interesting but we have actually reverted to old technology in the manufacture of products, but having said that we use modern machines and so on, but the technology of making a product has reverted back.

There is a considerable amount of science involved in dough-making. Enzymes, bacteria and cultures are associated with the production of fermented doughs. Since the introduction of sour-doughs students are familiarised with the scientific principles involved in this practice.

Question 4

What changes if any have been made at the NBS to facilitate a change in culture?

We have introduced new practical modules as part of our new degree programme for those who want to follow a definite programme. They are subject specific and have been offered out on a stand alone basis for those who cannot follow a definite programme. The uptake has been very interesting from the point of view of numbers doing those modules particularly from non-Irish approximately 10%, who are interested in what we are doing and want to improve their qualifications and knowledge of baking.

Question 5

Has economic growth impacted on curriculum development?

Yes. No question or doubt about that. Rapid expansion of the Irish economy over the last ten years has enabled people to spend more income on what might be described as luxury items which involved spending more on recreation including short food appreciation courses with cookery schools and ourselves being part of that.

Question 6

Have consumer patterns impacted on curriculum design?

Yes. Consumers are more quality and hygiene conscious. They are more travelled, all that combined people are looking for products in Ireland similar to those abroad. This is one reason people are taking up bakery classes.

Question 7

Has there been a change in student profile with the introduction of modularisation?

Yes. 15 years ago 90% of students were male and 10% female now those figures are 70% and 30%. There is a higher percentage of non-national students could not tell you the exact percentage. In the past the average age was between 17-22 now it is between 18-65

Question 8

Has DIT Policy and National or European Legislation impacted on curriculum design? (Bologna Agreement 1999) and the DIT Act 1992?

Modularisation has impacted no question or doubt about that. Taking on the Bologna Agreement the DIT took the decision that all modules run along the Bologna guidelines sometimes its good but a 3 hour lecture is a long time. We try to have back to back lectures so as to facilitate part-time students coming in. Recently in the DIT Quality Assurance is being replaced by Cost Control measures.

Question 9

Does staff professional development within the NBS facilitate a change in curriculum design?

Yes Staff Professional Development can encompass a number of different aspects a number of staff are taking masters in education while others are improving skills so as to become proficient in teaching new practical modules or programmes. We try to keep up to date.

Question 10

Has collaboration between the National Bakery School and the German Baking Academy impacted on curriculum design?

Yes. It is widely recognised that the German people are highly organised which is reflective of the courses offered there which are very fine tuned. The courses that are offered there help to continue what we are doing. Staff here are proficient in all areas, no matter what teacher students have the programme is followed exactly the same way.

The 20/21 initiative followed collaboration with Germany. Holland was instrumental in this programme bringing together bakery education institutes from Switzerland, Germany, Austria and eventually Ireland. It involved student and staff exchanges throughout European. Students were involved in 6 week exchange programmes while staff were involved in product development. It gave them the opportunity to see what was going on in Europe, it was an eye opener.

APPENDIX B

Number 1

Student Survey Questionnaire 1

To be completed by participants prior to undertaking the German bread making course.

- Q1* What are your feelings and expectations towards this course?
To be able to produce German bread on my return to Ireland
- Q2* Why are you participating on this course?
Because I have a particular interest in German Breads.
- Q3* What do you hope to learn from this experience?
To learn the German techniques in bread making.
- Q4* In your opinion what are the merits of undertaking this course?
The hands on experience.
- Q5* Has the undertaking of this course presented you with any difficulties?
No.
- Q6* Do you envisage any difficulties on this course?
Language barriers

Comments None

Number 2

Student Questionnaire 1

To be completed by participants prior to undertaking the German bread making course.

- Q1* What are your feelings and expectations towards this course?
I am going with an open mind
- Q2* Why are you participating on this course?
It is good to see another country's work practices.
- Q3* What do you hope to learn from this experience?
Learn more about German Breads and interested in International bread making.
- Q4* In your opinion what are the merits of undertaking this course?
Hands on experience.
- Q5* Has the undertaking of this course presented you with any difficulties?
Not so far.

Q6 Do you envisage any difficulties on this course?
Language barriers and that I hope to keep with other students.

Comments None

Number 3 Student Questionnaire 1

To be completed by participants prior to undertaking the German bread making course.

Q1 What are your feelings and expectations towards this course?
The course was highly recommended by past pupils. Looking forward to the German approach to teaching.

Q2 *Why are you participating on this course?*
I hope to be able to put into practice what is to be taught during the week.

Q3 *What do you hope to learn from this experience?*
A broader appreciation of German bread making.

Q4 *In your opinion what are the merits of undertaking this course?*
It will be valuable when seeking job opportunities. To have completed the course.

Q5 *Has the undertaking of this course presented you with any difficulties?*
No.

Q6 Do you envisage any difficulties on this course?
No.

Comments	None
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Number 4 Student Questionnaire 1

To be completed by participants prior to undertaking the German bread making course.

Q1 *What are your feelings and expectations towards this course?*
Relaxed friendly atmosphere. Hands on practical work. A clear and good knowledge of German bread-making.

Q2 *Why are you participating on this course?*
This course will benefit my knowledge of breadmaking.

Q3 *What do you hope to learn from this experience?*

Q4	<i>In your opinion what are the merits of undertaking this course?</i> Learning in a relaxed and friendly atmosphere with a small group and hands on experience of making and understanding German yeasted products.
Q5	<i>Has the undertaking of this course presented you with any difficulties?</i> No.
Q6	<i>Do you envisage any difficulties on this course?</i> No.
Comments	None

To be completed by participants prior to undertaking the German bread making course.

- Comments None

To be completed by participants prior to undertaking the German bread making course.

- 123

Q2 *Why are you participating on this course?*
To improve existing skills, to have a bit of “craic”, develop new skills, to discover and work with new ingredients, to learn about all aspects of German culture.

Q3 *What do you hope to learn from this experience?*
See Question 2

Q4 In your opinion what are the merits of undertaking this course?
See Question 2

Q5 *Has the undertaking of this course presented you with any difficulties?*
Not really. Job sharing teacher on mid-term break, so other than missing out on family time it has not presented any difficulties

Q6 Do you envisage any difficulties on this course?
Language barrier. Ingredients may not be obtainable in Ireland. Will I be able to stand after 8 hours.

Comments	None
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Number 7 Student Questionnaire 1

To be completed by participants prior to undertaking the German bread making course.

Q1 What are your feelings and expectations towards this course?
I am looking forward to the course. A little nervous, but excited.

Q2 *Why are you participating on this course?*
I want to learn more about bread from every angle.

Q3 *What do you hope to learn from this experience?*
I hope to learn at first hand the German Bread-making process.

Q4 In your opinion what are the merits of undertaking this course?
Hands on is always better.

Q5 *Has the undertaking of this course presented you with any difficulties?*
No not at all. Just nerves for the first day.

Q6 Do you envisage any difficulties on this course?
No. I hope not.

Comments	None
----------	------

Number 8

Student Questionnaire 1

To be completed by participants prior to undertaking the German bread making course.

- Q1 What are your feelings and expectations towards this course?*
My feelings are that I would enjoy the course and in that my expectations would be to learn with view to passing the skill on to others.
- Q2 Why are you participating on this course?*
To improve my knowledge and skills in bread-making giving me the confidence to experiment in breads.
- Q3 What do you hope to learn from this experience?*
That being in another country would teach me the attitude towards baking in the German Culture and hopefully bring this back to Ireland.
- Q4 In your opinion what are the merits of undertaking this course?*
To be able to add to my C.V the level of learning I have undertaken, within DIT, Kevin St. and the Food Industry.
- Q5 Has the undertaking of this course presented you with any difficulties?*
Thankfully no, my family are very supportive. As I am self-employed I would drive myself to learn as much as possible.
- Q6 Do you envisage any difficulties on this course?*
Firstly the language and the length of time allocated to the course. Would the back up notes be sufficient and the products available in Ireland.

Comments: Filling the form on the bus has added to the deterioration of my writing. What does "hermeneutics mean? but a pleasure to be able to give feedback. Looking forward to the read.

Number 9

Student Questionnaire 1

To be completed by participants prior to undertaking the German bread making course.

- Q1 What are your feelings and expectations towards this course?*
Very excited, hoping to improve my knowledge of German Bread-making.
- Q2 Why are you participating on this course?*
It is an accredited course, it might improve job prospects.
- Q3 What do you hope to learn from this experience?*
Experience German Culture, experience the German Baking educational system. Compare the use of ingredients and techniques with the DIT experience.
- Q4 In your opinion what are the merits of undertaking this course?*
Learn German bread-making at base particularly the craft of making sour-doughs. Witness the standards of German breads at first hand. See the selection of breads available.
- Q5 Has the undertaking of this course presented you with any difficulties?*
No. Travel arrangements were well organised.

Q6 Do you envisage any difficulties on this course?
Language.

Comments: **None**

Number 10

Student Questionnaire 1

To be completed by participants prior to undertaking the German bread making course.

Q1 What are your feelings and expectations towards this course?
I am looking forward to the course and expect to learn useful tips and new recipes.

Q2 Why are you participating on this course?
1) German Bread is supposed to be the best in the world. 2) I want to learn a bit more and have a break as well.

Q3 *What do you hope to learn from this experience?*
Experience German Culture, experience the German Baking educational system

Q4 *In your opinion what are the merits of undertaking this course?*
Learn German bread-making at base particularly the craft of making sour-doughs. Witness the standards of German breads at first hand. See the selection of breads available.

Q5 *Has the undertaking of this course presented you with any difficulties?*
No. Travel arrangements were well organised.

Q6 Do you envisage any difficulties on this course?
Language.

Comments: **None**

APPENDIX C

Student Survey: Questionnaire 2

Student 1

To be completed at the end of the course:

- Q1 On completion of the course how do you feel?*
Tired
- Q2 Has this course been to your satisfaction?*
Yes
- Q3 What have you learned from this experience?*
How to make a lot of German Bread varieties.
- Q4 Did you encounter any difficulties?*
No.
- Q5 Was there a language barrier?*
A little but didn't deter from course.
- Q6 On completion of this course, what do you think are the benefits of it?*
A better understanding of German Breads.
- Q7 Have you any recommendations or advice for students undertaking this course?*
Listen, look, and Learn
- Q8 How does this bread making course compare with that at the NBS?*
More intense study of German Bread
- Q9 How can this course be of benefit to you?*
Would feel confident in producing a German Product.
- Q10 Would you recommend this course to other students.*
Yes

Comments: None

Student Survey: Questionnaire 2

Student 2

To be completed at the end of the course:

- Q1 On completion of the course how do you feel?*
Satisfied
- Q2 Has this course been to your satisfaction?*
Yes. Delighted with the gluten-free bread recipes.

- Q3 What have you learned from this experience?*
How to make bread in machines.
- Q4 Did you encounter any difficulties?*
No.
- Q5 Was there a language barrier?*
Yes, always is.
- Q6 On completion of this course, what do you think are the benefits of it?*
Seeing bread being made
- Q7 Have you any recommendations or advice for students undertaking this course?*
No.
- Q8 How does this bread making course compare with that at the NBS?*
Good experience to make bread in machines.
- Q9 How can this course be of benefit to you?*
I will buy a machine and intend to make bread.
- Q10 Would you recommend this course to other students.*
Yes

Comments: None

Student Survey: Questionnaire 2

Student 3

To be completed at the end of the course:

- Q1 On completion of the course how do you feel?*
I enjoyed the week very much. Tired but happy.
- Q2 Has this course been to your satisfaction?*
Yes. It was great
- Q3 What have you learned from this experience?*
To make rye and sour-dough breads, also sweet yeast breads and stollen.
- Q4 Did you encounter any difficulties?*
Slight difficulty translating the gluten free recipes.
- Q5 Was there a language barrier?*
A little but that is to be expected.
- Q6 On completion of this course, what do you think are the benefits of it?*

Great to experience the German culture and spend time here. Great to learn to make German bread.

Q7 Have you any recommendations or advice for students undertaking this course?

Bring lots of white T-shirts and clean aprons.

Q8 How does this bread making course compare with that at the NBS?

Great to work in groups, not as much pressure weighing ingredients as NBS.

Q9 How can this course be of benefit to you?

Will make stolen and some of the rye breads.

Q10 Would you recommend this course to other students.

Definitely

Comments:

I appreciated very much receiving my certificate as I still haven't received one from the cake course I did last May in Germany. Nice to come home with it.

Student Survey: Questionnaire 2

Student 4

To be completed at the end of the course:

Q1 On completion of the course how do you feel?

This was a very worthwhile experience.

Q2 Has this course been to your satisfaction?

Yes.

Q3 What have you learned from this experience?

Different Techniques.

Q4 Did you encounter any difficulties?

No.

Q5 Was there a language barrier?

Slightly

Q6 On completion of this course, what do you think are the benefits of it?

Understanding the methods and techniques involved.

Q7 Have you any recommendations or advice for students undertaking this course?

This is a very worthwhile course for someone in a bakery, pastry, chef field.

Q8 *How does this bread making course compare with that at the NBS?*

The use of different types of European flours.

Q9 *How can this course be of benefit to you?*

I would like to make those products as good as my European counterparts.

Q10 *Would you recommend this course to other students.*

Very much so.

Comments:

Student Survey: Questionnaire 2

Student 5

To be completed at the end of the course:

Q1 *On completion of the course how do you feel?*

I feel that I have learned quite a bit and look forward to trying the new recipes out at home

Q2 *Has this course been to your satisfaction?*

Yes. It has been great.

Q3 *What have you learned from this experience?*

To experiment with additional ingredients in the bread.

Q4 *Did you encounter any difficulties?*

None. Everybody was very friendly and could not have been more helpful.

Q5 *Was there a language barrier?*

No. Linda translated as requested.

Q6 *On completion of this course, what do you think are the benefits of it?*

Broadens the Irish experience of breads. Nice to know how some of the many German types of bread are made, and to be able to recognise them in the shops and bakeries.

Q7 *Have you any recommendations or advice for students undertaking this course?*

Go to bed early because you must start at 8.30 each morning. Only bring flat shoes. Bring cash because the shops, hotel, and restaurant don't like credit cards.

Q8 *How does this bread making course compare with that at the NBS?*

This course shows how to produce more commercial quantities and the machinery in producing same.

Q9 *How can this course be of benefit to you?*

New recipes for incorporating seeds/nuts/different flours into bread. Interesting to see how many different products can be made from some basic dough.

Q10 *Would you recommend this course to other prospective students.*

Yes. I would tell them that the days are long but manageable. They will learn a lot and have a good time.

Comments:

Student Survey: Questionnaire 2

Student 6

To be completed at the end of the course:

- Q1 On completion of the course how do you feel?*
Very satisfied.
- Q2 Has this course been to your satisfaction?*
Yes.
- Q3 What have you learned from this experience?*
As for Q.6
- Q4 Did you encounter any difficulties?*
No.
- Q5 Was there a language barrier?*
No.
- Q6 On completion of this course, what do you think are the benefits of it?*
Knowledge of a vast range of breads, equipment and history.
- Q7 Have you any recommendations or advice for students undertaking this course?*
Take plenty notes, especially timings.
- Q8 How does this bread making course compare with that at the NBS?*
Very different composition but equally as good.
- Q9 How can this course be of benefit to you?*
New knowledge.
- Q10 Would you recommend this course to other prospective students.*
Yes.

Comments:

Student Survey: Questionnaire 2

Student 7

To be completed at the end of the course:

- Q1 On completion of the course how do you feel?*
I'm sad it is over! I feel more confident in my baking now, and I cannot wait to carry on with the skills I've learned

- Q2 Has this course been to your satisfaction?*
It surpasses my expectations. Highly recommended.
- Q3 What have you learned from this experience?*
I have learned a lot about temperatures etc. and how important the simple things are in bread making.
- Q4 Did you encounter any difficulties?*
None at all.
- Q5 Was there a language barrier?*
No. Linda was a great help. It made me want to learn German more.
- Q6 On completion of this course, what do you think are the benefits of it?*
I feel I have benefited from it from every angle of baking.
- Q7 Have you any recommendations or advice for students undertaking this course?*
Look, Listen, Practice, take it seriously!! enjoy!
- Q8 How does this bread making course compare with that at the NBS?*
It is very different. (not taking away anything from the NBS) It is more intense.
- Q9 How can this course be of benefit to you?*
It's made me want to be a baker (far more now)
- Q10 Would you recommend this course to other prospective students.*
Most definitely

Comments:

Student Survey: Questionnaire 2

Student 8

To be completed at the end of the course:

- Q1 On completion of the course how do you feel?*
Very enjoyable course, feel like I learned a lot. Staff at the hotel were lovely, German people were very friendly. Very sad to be leaving.
- Q2 Has this course been to your satisfaction?*
Yes definitely.
- Q3 What have you learned from this experience?*
I have learned a lot about German culture and baking.
- Q4 Did you encounter any difficulties?*
No, people were lovely, very friendly.
- Q5 Was there a language barrier?*

No it actually wasn't a problem. I thought it would but all the staff had good English and always tried their best to understand us.

- Q6 On completion of this course, what do you think are the benefits of it?*
I have learned a lot about bread-making in Germany, production systems and the bakery education system in general.
- Q7 Have you any recommendations or advice for students undertaking this course?*
Learn some basic German.
- Q8 How does this bread making course compare with that at the NBS?*
It is a very full 5-day course like a few weeks at the NBS crammed into 5 days. The actual bakeries here are amazing compared to the ones at the NBS.
- Q9 How can this course be of benefit to you?*
Very good experience, fun and educational.
- Q10 Would you recommend this course to other prospective students.*
Yes definitely. I will be coming back next year.

Comments:

Student Survey: Questionnaire 2

Student 9

To be completed at the end of the course:

- Q1 On completion of the course how do you feel?*
Tired. The week was very intensive with early start in the bakery 8.30-5pm
- Q2 Has this course been to your satisfaction?*
Yes.
- Q3 What have you learned from this experience?*
A good understanding of the German speciality breads.
- Q4 Did you encounter any difficulties?*
No. The input from the DIT staff was way above expected involvement and this way everything went without a hitch.
- Q5 Was there a language barrier?*
No – excellent English plus German interpreter.
- Q6 On completion of this course, what do you think are the benefits of it?*
This course is very helpful, relevant to the 3yr Degree course in DIT.
- Q7 Have you any recommendations or advice for students undertaking this course?*
The course in Germany is very intensive so I want to advise future participants of the long hours in the bakery and early start.

- Q8 How does this bread making course compare with that at the NBS?*
A complete semester in 3 days – exhausting.
- Q9 How can this course be of benefit to you?*
I feel more confident with the physical hands on approach to bread-making gained there. The excellent teaching and encouragement by the Master Bakers.
- Q10 Would you recommend this course to other prospective students.*
Yes. A thoroughly worthwhile experience either as a whole-time degree student or part-time student.

Comments:

The course is well designed it demands that students participate to get as much out of the course and benefit from its teaching.

Student Survey: Questionnaire 2

Student 10

To be completed at the end of the course:

- Q1 On completion of the course how do you feel?*
Informed, aware of how much is involved in relation to the bread making.
- Q2 Has this course been to your satisfaction?*
Satisfied to the point where I would look at doing another course in the sweets, pastry.
- Q3 What have you learned from this experience?*
We covered a three day intensive course, covering all aspects of bread-making. The German way is slightly different, they use a lot more butter (water) in their recipes making the breads much richer and lots of sugars. The flavour is an education.
- Q4 Did you encounter any difficulties?*
The interpreter was excellent, but at times the breads that were cooked were sometimes hard to follow, the notes were good but the practical was very important.
- Q5 Was there a language barrier?*
50/50
- Q6 On completion of this course, what do you think are the benefits of it?*
The recipes that were supplied were almost possible to produce, that is if you could get the rye flour, and work out the percentages.
- Q7 Have you any recommendations or advice for students undertaking this course?*
To have started and covered the bread-making course 1 / 2. The knowledge of the “starter” is essential and the awareness of the rye/wheat quantities / percentage a yes.
- Q8 How does this bread making course compare with that at the NBS?*
The volume cooked is different, hands on is different as we did not have a work station. No need to worry about “clean as you go”, as they have their own cleaners to do this.
- Q9 How can this course be of benefit to you?*

The benefits are the knowledge of different breads made, the method of the shapes, how they were achieved, and a total appreciation of the art and bread making skills.

- Q10 Would you recommend this course to other prospective students.*
Yes. But only if they were totally committed to the course and also the appreciation of food tasting.

Comments:

The summary of the 5 day trip was very positive, we made friends, had fun and also appreciated everything that everyone did for each other. Lovely area and will come back.

Student Survey: Questionnaire 2

Student 11

To be completed at the end of the course:

- Q1 On completion of the course how do you feel?*
Informed, very intensive course.
- Q2 Has this course been to your satisfaction?*
Yes. Well co-ordinated, and challenging.
- Q3 What have you learned from this experience?*
Yes. New bread-making techniques.
- Q4 Did you encounter any difficulties?*
No
- Q5 Was there a language barrier?*
No
- Q6 On completion of this course, what do you think are the benefits of it?*
Learning the German way. Compare with the NBS. Experience German culture.
- Q7 Have you any recommendations or advice for students undertaking this course?*
Stay alert, look, listen and practice.
- Q8 How does this bread making course compare with that at the NBS?*
Mechanised bread-making techniques. Practice with sour-dough cultures.
- Q9 How can this course be of benefit to you?*
C.V enhancement and promote job opportunities.
- Q10 Would you recommend this course to other prospective students.*
Yes. An opportunity for a student to be involved in the art of German bread-making

Comments:

Student Survey: Questionnaire 2

Student 12

To be completed at the end of the course:

- Q1* *On completion of the course how do you feel?*
Very happy I came on the course.
- Q2* *Has this course been to your satisfaction?*
Yes.
- Q3* *What have you learned from this experience?*
A good knowledge of German bread-making.
- Q4* *Did you encounter any difficulties?*
No
- Q5* *Was there a language barrier?*
A little.
- Q6* *On completion of this course, what do you think are the benefits of it?*
A good knowledge of German bread-making.
- Q7* *Have you any recommendations or advice for students undertaking this course?*
- Q8* *How does this bread making course compare with that at the NBS?*
- Q9* *How can this course be of benefit to you?*
Help in my work environment
- Q10* *Would you recommend this course to other prospective students.*
Yes.

Comments:

It would be very important that students apply the Hygiene Standards that are in the DIT Bakery, for example Safety Shoes worn, and (or) wear proper head gear that covers all the hair especially those with long hair.

APPENDIX D

Ethics Statement

Name Mary Kavanagh
Address National Bakery School
Contact mary.kavanagh@dit.ie
Date. 07/02/08

Higher Education Institutes including the Dublin Institute of Technology have their own ethical guidelines and protocols for carrying out research, which cover issues such as confidentiality, security, and privacy, it is within those guidelines that I intend to carry out my research. I am committed to informing all participants the purpose of the research, the merits of their participation, its significance and the manner in which it will be reported.

To ensure that I comply with the highest ethical principles I intend to ensure that the following procedures are undertaken:

- 1 I have permission from my Head of School to undertake this research.
- 2 I will ensure that the information that I report is truthful, lawful and within the public domain
- 3 Individuals are adequately informed of the purpose of the research
- 4 Individuals are voluntary participants in this research.
- 5 Individuals can withdraw from the research at any time.
- 6 I will avoid plagiarism and ensure that reference is made at all times to the work of others.
- 7 I will take responsible measures at all times for the confidentiality, security, and storage of the information obtained from participants for the research.

Signature

Date

Research Information sheet

Name Mary Kavanagh
Address National Bakery School
Contact mary.kavanagh@dit.ie
Date 07/02/08

I am a member of staff at the National Bakery School, currently I am studying for an MA in Third Level Learning and Teaching. As part of my MA I am conducting a hermeneutic or interpretive case study research project which aims to evaluate the changes in curriculum practice at the National Bakery School from 1998-2008. The findings of this research project should be of benefit to students and academic staff. Care will be taken at all times to preserve the anonymity and confidentiality of participants while guaranteeing that the information will be preserved and reported solely in the form of a thesis.

I intend to gather data by conducting interviews, carrying out surveys, and seeking relevant documentation. I would be very grateful if you are willing to participate in this research project as your contribution is immensely valuable.

I am also enclosing a copy of my Ethics Statement with this Information Sheet for you to read and understand prior to signing the Consent Form in acknowledgement of your approved participation. I would appreciate if you could sign and return with the completed questionnaire when it is convenient for you to do so.

I am very grateful for your input in this research project, on completion my thesis will be available for anyone to read.

Thank You in anticipation for your co-operation,

Signed -----

Consent Form

Researcher **Mary Kavanagh**
Address **National Bakery School**
Contact mary.kavanagh@dit.ie
Date **07/02/08**

I have been adequately informed of the purpose of this research and therefore I agree to be a voluntary participant in this research project, furthermore I am aware that I can withdraw from this research at any time.

Name

Signature

Date

National Bakery School,
Dublin Institute of Technology,
Kevin St.,
Dublin 8.

27/02/08

Dear Colleague,

I would appreciate very much if you would agree to be interviewed by me for the purpose of my research. I enclose a copy of the Research Information Sheet, Ethics Statement, and a Consent Form along with a copy of the proposed interview questions. This is for your perusal prior to the interview. I intend to record the interview pending the consent of each interviewee. Your contribution to this research is much appreciated and I look forward to hearing from you.

Kind Regards,

Mary

APPENDIX E

Module Descriptors

Module Title

TFBK3023 Artisan Bread Technology

Module Description

This module deepens the learners knowledge of the technology and techniques used in the production of live dough for artisan bread and artistic dough pieces.

Module Aims

The aim of this module is to expand and refine the learners understanding and knowledge of artisan baking techniques, methods and ingredients and increase awareness of the emerging interest in specialty breads in the field of baking arts.

Learning Outcomes

1. Demonstrate specialized knowledge across a range of different types and forms of sour dough from historical origins, to current and emerging knowledge and trends.
2. Identify the different rheological properties of a sour dough as it develops and grows
3. Extend and refine a range of specialized manipulation skills and knowledge in predough and sour dough production.
4. Critically evaluate a variety of specialist equipment and utensils used in the production of the artisan bread products and artistic dough pieces
5. Utilise a range of diagnostic and creative skills in the production of a selection of artistic dough pieces and a variety of world wide sour dough breads.
6. Demonstrate an understanding of dough development mixing speed and time flour/dough hydration, autolise and bassinage.

Learning and Teaching Methods

The focus will be on student centered learning and development. The teaching strategies will include lectures, practical demonstrations, class discussion and practical bakery laboratory work. The students will be encouraged to undertake market research by visiting bakeries, supermarkets, web sites and the library.

Indicative Content

Unit 1. Plaited Bread # 1

The production of 1,2,3,4,5, and 6 string plaits and the decorating possibilities available.

Unit 2. Plaited Bread #2 - Advanced Techniques

The production of a plaited star. Novelty animal shapes – the use of sweet dough..

Unit 3. Traditional German Speciality Breads

Tomato and onion bread – variations and combinations of savory ingredients, production techniques.

70/30 Rye with caraway – flavoured dark rye breads

Unit 4. French Bread Specialties

Organic Spelt – History, composition, dough making and production techniques. French Regional variety – history and production techniques.

Unit 5. Yeast Bread Roll Specialties

Three seed rolls – dough making technique, crumb structure and characteristics. Cranberry and orange – production techniques

Unit 6. Italian Specialties

Regional style long fermentation bread - history, production techniques Decorated saffron foccacia – combined use of saffron polish and bassinage, finishing techniques. Pizza Roma – flour hydration.

Unit 7. Sweet Specialties

Pecan and Raisin – varieties, origins and production techniques. Walnut and Malted grains – malting.

Unit 8. Savory Bread Varieties

Buckwheat and Buttermilk – history, use and production techniques. Potato and chive – ingredients preparation and production techniques.

Unit 9. French Bread Specialties #2

Pain au Levain -History and use, production techniques. Pain sur Poolish – dough development, history and production techniques.

Unit 10. French Specialty Products #3

Speciality baguettes- History, production methods, varieties. Pumpkin seed bread – use of French rye sours.
 Unit 11. Fundamentals of live dough making for artistic dough pieces # 1
 Speciality piece – live dough production, templates, dough cutting shaping and modeling.
 Unit 12. Artistic dough pieces – Advanced techniques
 Developing, designing and assembling an artistic dough piece.

Module Assessment

1 Continuous & 1 Summative assessment

Components	Percentage	Required
Assessment 1	50%	
Assessment 2	50%	
Examination		
Other		

Special Instructions

Continuous assessment: This is an assessment of the individual learners' performance over the period of the module. The learner is required to demonstrate a progression towards a deep understanding and the range of specialized skills used in the different process of fermentation and baking. The learner must be capable of critically evaluating the range technology used in the production of the bread products including safety and demonstrate progression in understanding dough development, time and temperature control.

Summative assessment: At the conclusion of the module the learner will present a selection of breads. The learner is required to critically evaluate the methods of various natural bread improvers and how these can effect the fermentation, dough development and the final dough structure. The learner must demonstrate a range of manipulation skills and knowledge of the underpinning science and technology in product quality and best practice.

Module Title

TFBK3022 Viennoserie & Konditorie Technology

Module Description

This module introduces the learner to the technology and techniques used in the production of Viennoiserie (classical French laminated and non-laminated sweet dough) and Konditorie (classical German Torte and Desert).

Module Aims

The aim of this module is to build on the knowledge and expertise from the Bread, Cake, Sweetbread and Pastry modules and to expand, deepen and refine the students understanding, knowledge and skills of both French Viennoiserie and German Konditorie production techniques, together with pre and post baking methods

Learning Outcomes

1. Demonstrate a knowledge of Viennoiserie and Kondirorie, including historical origins and quality factors
2. Exercise judgment in the planning and preparation of a range of Viennoiserie and Konditorie.
3. Extend and refine a range of creative skills and knowledge of the science and technology in the production of range of Viennoiserie and Konditorie.
4. Evaluate and contrast a variety of specialist equipment and technology used in the production of the Viennoiserie and Konditorie, including safety aspects.
5. Produce a range of Viennoiserie and Konditorie using different techniques incorporating best practice

Learning and Teaching Methods

The focus is on learner centered learning and development. The teaching strategies will include lectures, practical demonstrations, class discussion and applied bakery laboratory work. The learners will be encouraged to undertake market research by visiting bakeries, supermarkets, web sites and the library. Learners will be encouraged to expand their research by paying short work experience visits to France, Germany and Austria

Indicative Content

Viennoiserie

Unit 1. Laminated Dough Technology - Advanced Techniques

Review of lamination technology including mixing, rolling, turning and forming techniques including French method; English method; Scotch, Blitz and Dutch method; Co-extrusion; Sandwich method and the Curling method. Re-evaluation of importance of (a) flour type: protein content, water content and absorption ability, extensibility and stability; (b) Fat type: Slip and smoke point; dairy, hydrogenated, oils; lamination stability; taste, flavour and palate cling; Liquid: Water, milk and egg; hydration factor; temperature and use of ice; Salt: flavour factor; shelf life extension; astringent factor; Supplementary ingredients.

Unit 2. Laminated yeasted Dough

Technique and theory of preparation of yeasted doughs including fermentation, dough hydration, temperature control, kneading and formation methods. Application of this theoretical knowledge. Production of Butter Croissant; Pain au Chocolate; Pain au Raisin; Danish Pastries; Cinnamon Rolls; Pain au Lait.

Unit 3. Laminated Non-Yeasted Dough

Technique and theory of preparation of non-yeasted dough including dough hydration, temperature control, kneading and formation methods. Application of this theoretical knowledge. Puff Pastry; Flakey Pastry; French Regional varieties including palmiers; mille-feuille; pithiviers; together with history and production techniques.

Unit 4. Non Laminated Dough

Technique and theory of preparation of non-laminated dough including dough hydration, temperature control, kneading and formation methods. Application of this theoretical knowledge. Production of Pâté Sucrée; Pâté Brisée; Pâté Sablé; Pâté Choux; Classic Austrian strudel.

Unit 5. Fillings, Glazes and Decoration.

Identification, preparation, technique, theory and application of a variety of classic embellishments, including: Citrus Cream; Pecan cream; Chocolate & Orange Cream; Almond Cream; Chocolate & Pear Cream; Sun dried Tomato and Basil filling; Use of liqueurs as flavour bases and in glazes, including Kirsch, Grand Marnier, Baileys Irish Cream, Cointreau and Dark Rum.

Unit 6. Revision

Konditorie

Unit 7.

Review of cake technology including mixing, batter type and aerated sponge type. Re-evaluation of importance of (a) flour type: protein content, water content and absorption ability, extensibility and stability; (b) Fat type: Slip and smoke point; dairy, hydrogenated, oils; creaming ability; taste and flavour; Liquid: Water, milk and egg; hydration factor; Sugars: flavour factor; shelf life extension; flow factor; Supplementary ingredients.

Unit 8. Blechkuchen

Students are introduced to a range of high quality sheet cakes suitable for bake and coffee shop point of sale and packaged for retail sale. Schneckenkuchen and Franzipankuchen; Obst-Quarkschnitten; Sahnequark Zuckerkuchen; Bienenstich;

Unit 9. German Sandmassen specialties

Students are introduced to a range of butter based egg foam cake mixtures including a range of high quality single portion cakes suitable for bake and coffee shop point of sale and packaged for retail sale. Sandkuchen; Marmorkuchen; Schokokuchen; Mandlekuchen; Nußkuchen; Schoco-Rumkuchen;

Unit 10. Krems and Fonds

Students are introduced to the wide range of filling creams. This include German Cream; French Cream; Use of Gelatine and starches and stabilizers; Cold and warm techniques; The range covered will include Sahnekremrollen; Maraschine Sahnekremtorte; Flocken Sahnekremtorte; Erdbeer Sahnekremtorte; Schwarzwälder Kirschtorte;

Unit 11. German Torten Specialties #1

Students are introduced to the concept of classic German torte technology and the professional bakers concept of quality. The range covered will include: Deutsch Apfeltorte; Schokoladentorte; Weinkremtorte (Herrentorte);

Unit 12. Revision

Module Assessment

1 Continuous & 1 Summative assessment

Components	Percentage	Required
Assessment 1	50%	
Assessment 2	50%	
Examination		
Other		

Special Instructions

Continuous assessment: This will comprise an assessment of the individual learners performance in the bakery laboratory. The learner is required to demonstrate an understanding of the specific characteristics of the ingredients used and the different process of fermentation and baking. The learner must be capable of critically analyzing contrasting the various pieces of specialist equipment and technology and demonstrate an understanding of the importance of accurate weighing, time and temperature control.

Summative assessment: At the conclusion of the module the learner will present a selection of breads from the products covered in this module. The learner is required to demonstrate a knowledge of best practice and an ability to critically evaluate the various natural bread improvers, the fermentation, dough development and the final dough structure. The learner must demonstrate a range of artistic and manipulation skills and a knowledge of the underpinning science and technology.

Module Title

TFBK3027 Functional Foods and Food Allergens

Module Description

Functional Foods and Food Allergens.

To enable students to develop an understanding of Functional Foods and Food Allergens related to ingredients used in the bakery and general food and food service industry.

Module Aims

The student on the completing this module should identify Functional Foods and Food Allergens and how they effect baked products, food and the consumer. Work within safe guidelines by recognising ingredients used and their function in relation to nutrition, which could affect the wholesomeness and safety of food. This module will increase the student's awareness of the emerging interest in functional foods and the production of products suitable for Food Allergy Sufferers.

Learning Outcomes

Having completed this module students should be:

Understand and identify what functional foods are their benefits and function in products.

Understand the use and application of Functional Foods in Baked Product.

Understand labeling and legal issues involved when using functional foods in products.

Demonstrate the concept of team work.

Demonstrate the ability to make and produce various baked products supplemented with Functional Food ingredients.

Understand Food Allergens and how it affects sufferers.

Identify occupational allergies.

Understand the law in relation to food allergies and occupational allergy.

Identify the principle Food Allergen intolerable in relation to Coeliac Disease and Diabetes.

Identify substitute ingredients and their properties.

Demonstrate theoretical and practical understanding of the role and function of gluten free / wheat free flours.

Understand diabetes and how sugar substitutes are used in baked products.

Understand the Glycemic Index in relation to baked products.

Demonstrate theoretical and practical understanding of the role and function of sugar replacers.

Critically evaluate the role of functional Foods and ingredient substitutes in baked product.
Be capable of working in a group project, interpretation of the results obtained in a baking test in a logical and useful way.

Learning and Teaching Methods

The teaching strategies will include:

Lectures and laboratory Practical. Student will be actively encouraged to engage in their own learning through lecture, tutorials and projects.

Indicative Content

Unit 1

Functional Foods Introduction. Food Pyramid, Demand for functional Foods. The benefits of Functional foods. Functional foods and their properties suitable for baked goods

Unit 2

Changing demand from the consumer for functional ingredients. A study of Folic Acid, Fish Oils, Protein Enriched, Vitamin Enriched, Low Sodium functional foods, Examples of baked products with functional ingredients added
Labelling issues & Criteria

Unit 3

Functional Food Additives for baked goods.
Usage rates and directions for use.
Recipes and formulations for baked products using Functional Food additions.
Group project information.

Unit 4

Baking Bread Products with Functional Food Additives. Using controls for comparison.
Testing and analysing (This may have to be a 4 hour session in bakery) Group research and assessment of the baking performance of various Functional foods in bread products.

Unit 5

Baking Confectionery products with functional food additives. Using controls for comparison.
Testing and analysing (This may have to be a four hour session in the bakery) Group research and assessment of the baking performance of various Functional foods in confectionery products.

Unit 6

Food Allergies. What it is? Who gets it? Anaphylaxis. Outline of the effects, how it happens, how it's treated.
Types of allergies, Food allergy Tests, Food additives
Occupational allergies, Asthma, dermatitis, wasp allergy, hay fever
Occupational Allergy and the Law

Unit 7

Gluten Intolerance, wheat intolerance. What it is, how it happens and its effects.
Coeliac Disease. Gluten free products, flour replacers. (Gluten Free Flours, Rice Flour, Corn Flours, Potato starch, gums and starches.

Unit 8

Baking with gluten Free and wheat free Flours, Recipes and formulations.
Precautions within the food production area when producing Gluten free products
Labelling issues. Laws and regulations

Unit 9

Production of gluten free / wheat free products using flour substitutes. Testing and analysing. (This will be a four hour practical session) Group research and assessment of the baking performance of various products using gluten free and wheat free flours.

Unit 10

Diabetes
How it occurs, insulin, G.I(Glycemic Index)
Sugar substitutes. Baking with sugar substitute's recipe and formulations.

Unit 11

Production of sugar free products. Testing and analysing. (This will be a four hour practical session) Group research and assessment of the baking performance of various products using sugar substitutes.

Unit 12

Practical results, discussion and analysing from practical sessions
Group presentations.

Module Assessment

3 Assessments

Components	Percentage	Required
Assessment 1	30%	
Assessment 2	30%	
Examination		
Other	40%	

Special Instructions

Project/Written Report 40%,
Individual Assessment 30%,
Group Assessment 30%

Module Title

TFBK1027 Professional Baking Bread 1

Module Description

This is primarily a practical module focusing on the basic techniques of bread dough production. It is intended to develop the student's knowledge of breads and the production methods and techniques used in their manufacture.

Module Aims

The aim of this module is to introduce the student to the production methods and techniques of a basic range of bread products from Ireland and England plus some international specialties.

Learning Outcomes

1. Identify the ingredients used in the production of basic yeast raised products and understand their specific characteristics.
2. Understand the methods of incorporation of various natural bread improvers and how these can effect the fermentation, dough development and the final dough structure.
3. Understand the process of fermentation and baking.
4. Develop and refine their range of manipulation skills and knowledge of the science and technology involved.
5. Obtain an insight into the history, origins and significance of the various breads.
6. Understand the importance of hygiene and safety in the production of food.
7. Understand the importance of accurate weighing and time and temperature control.
8. Achieve a balance of nutritional value, texture and flavor in each item.
9. Identify and become familiar with the various pieces of specialist equipment and utensils used in the production of these basic bread products including any safety aspects.
10. Understand the importance of product quality and best practice.

Learning and Teaching Methods

The focus will be on student centered learning and development. The teaching strategies will include lectures, practical demonstrations, class discussion and practical bakery laboratory work. The students will be encouraged to undertake market research by visiting bakeries, supermarkets, web sites and the library.

Indicative Content

Unit 1. Fundamentals of Dough Making and Bread Baking # 1
 White one piece open pan bread – the use of dried yeast, the use of fresh yeast, the prime ingredients, temperature control, basic dough making.

Unit 2. Fundamentals of Dough Making and Bread Baking #2
 Brown Pan Bread – Brown Flours, Gluten Formation, Water Absorption.
 Granary Pans and Baps – Malted meals.

Unit 3. Traditional Irish Yeasted Breads
 Irish Batch Bread – fermentation times, baking times, production techniques.
 Oatmeal Pans – flaked oatmeal, pinhead oatmeal, use of soaks, dietary benefits

Unit 4. Irish and English Yeast Bread Specialties
 Irish Turnovers (Grinders) and English Cottage Loaf – history, production methods. Milk Pans – use of milk, legislation, effects of milk proteins and milk sugars.

Unit 5. Yeast Bread Roll Specialities
 Milk bread rolls – various shapes , prooving and baking
 Granary rolls – water absorption

Unit 6. Irish and Scottish Specialties
 Scotch Baps – history, production techniques
 London Bloomers – use of dough enriching agents, finishing techniques.
 Traditional Irish Soda Bread- chemical aeration, chemistry explained.

Unit 7. Irish and German Specialties
 Waterford Blah – origins and production techniques
 Partybrot – production of table centerpieces, use of seeds for decoration
 White Soda Bread- origins of soda breads, Irish wheat, climate and protine content

Unit 8. Basic Enriched Bread Varieties
 Yorkshire Tea Cakes- effects of inclusion of high levels of enriching agents.
 Plaited Bread-dough manipulation techniques, prebaking finishes
 Fruited Soda Bread-use of enriching agents, traditional soda bread shapes.

Unit 9. International Specialties
 Bridge Rolls-History and use, production techniques
 Holzfällerbrot- use of predough soak, rye flours nutritional value of seeds.
 American Corn Bread- varieties, production methods

Unit 10. Specialty Products #1
 Parker House Rolls- History, production methods, varieties
 Savory Soda Breads- use of cheese, herbs, vegetables.
 Drop Scones – effects of increased enrichment levels on powder aerated products.

Unit 11. Specialty Products #2
 Vienna Bread - dough making technique, crumb structure, crust characteristics
 Pepperoni and Cheese Bread- use of savory ingredients in yeasted breads

Unit 12. Specialty Products #3
 Garlic Buns- use of garlic, production techniques
 Beer Bread- use of beers as moistening agents, effects on fermentation and flavor.

Module Assessment

1 Continuous & 1 Summative assessment

Components	Percentage	Required
Assessment 1	50%	
Assessment 2	50%	
Examination		
Other		

Special Instructions

Continuous assessment: This is an assessment of the individual learners' performance over the period of the module. The learner must demonstrate an understanding of the specific characteristics of the ingredients the range of flours, and the advanced processes of fermentation and baking. The learner must demonstrate an understanding of the methods used to incorporate fruits and nuts and how these ingredients can effect the fermentation, dough development and the final dough structure. The learner must show that they are fully aware of and demonstrate an understanding of the importance of hygiene and safety in the production of food.

Summative assessment: At the conclusion of the module the learner will present a selection of breads. The learner is required to demonstrate that they have the acquired the range of manipulative skills and ability necessary to produce product to the highest quality using best practice. The learner must demonstrate that they can identify and are familiar with the various pieces of specialist equipment and utensils used in the production of these dough products including safety aspects.

Module Title

TFBK1026 Professional Baking Bread 2

Module Description

This practical module will focus on the advanced techniques of bread dough production. It is designed to build on and further expand the learners' skills and knowledge of breads and the role of bread in society and in enhancing the meal experience.

Module Aims

The aim is to introduce the learner to the production methods and techniques of an advanced range of bread dough products from both Ireland and England together with a range of European and world specialties and to create an in depth understanding and appreciation of the art of bread making.

Learning Outcomes

1. Identify the ingredients used in the production of yeast raised products and understand their specific characteristics.
2. Critically evaluate the range of flours used in this module.
3. Demonstrate an understanding of the methods used to incorporate fruits and nuts and how these ingredients can effect the fermentation, dough development and the final dough structure.
4. Demonstrate an understand the importance of hygiene and safety in the production of food.
5. Identify and become familiar with the various pieces of specialist equipment and utensils used in the production of these sweet dough products including any safety aspects.
6. Compare and contrast the importance of product quality and best practice.

Learning and Teaching Methods

The focus will be on learner centered learning and development. The teaching methods will include lectures, practical demonstrations, class discussion and practical bakery laboratory work. Students will be encouraged to undertake market research by visiting supermarkets, bakeries, visiting web sites and the library.

Indicative Content

Unit 1. French Specialties Fruit and Walnut Bread.- production methods. Fougasse au Fromage- types of cheese, heart breads production techniques.

Unit 2. Italian Specialties Focaccia- history, production, varieties. Pizza- history, varieties.

Unit 3. Continental Specialties # 2 Calzone and Stromboli – specialty filled pizza varieties. Onion Bread – use of fresh onions, effects on fermentation.

Unit 4. Continental Specialties # 2 Focaccia Farcita-production, use of various fillings. Alsace Flamkuchen-

origins, production, various toppings

Unit 5. Buttermilk Sour Dough. Bagels-history, production, varieties. Chowder Bread Bouls- production, use. Pitta Bread- history, production

Unit 6. International Specialties # 1 Linseed Bread – rye sours, presoaks, special dietary health breads. Challa – varieties, origins, religious background.

Unit 7. German Specialties Grahambrot- preparation and use of cracked wheat, dietary benefits. Weizenmischbrot- rye sours, manufacture and use, wild yeast's

Unit 8. Italian Specialties Ciabatta- origins, production techniques, biga. Pagnotta- effects and use of predoughs.

Unit 9. French Specialties Floured Baguette- poolish, manufacture, history, use and effects. Pain de Champagne- predough varieties, production methods

Unit 10. International Specialties # 2 San Francisco Sour Dough Bread- origins, unique characteristics, lactobacilli. Brioche-use of high levels of butter and their effect on fermentation and gluten structure.

Unit 11. International Specialties #3 French Breakfast Loaf- dough handling techniques, open texture. Russian Potato Bread- use and effects of using potatoes in doughmaking

Unit 12. International Specialties # 4 Naan Bread-use of yogurt, spices and ghee. Tomato and Fennel Bread- use of tomato puree, effects on fermentation

Module Assessment

1 Continuous & 1 Summative assessment

Components	Percentage	Required
Assessment 1	50%	
Assessment 2	50%	
Examination		
Other		

Special Instructions

Continuous assessment: This is an assessment of the individual learners' performance over the period of the module. The learner must demonstrate an understanding of the specific characteristics of the ingredients the range of flours, and the advanced processes of fermentation and baking. The learner must demonstrate an understanding of the methods used to incorporate fruits and nuts and how these ingredients can effect the fermentation, dough development and the final dough structure. The learner must show that they are fully aware of and demonstrate an understanding of the importance of hygiene and safety in the production of food.

Summative assessment: At the conclusion of the module the learner will present a selection of breads. The learner is required to demonstrate that they have the acquired the range of manipulative skills and ability necessary to produce product to the highest quality using best practice. The learner must demonstrate that they can identify and are familiar with the various pieces of specialist equipment and utensils used in the production of these dough products including safety aspects.

Module Title

TFBK1023 Professional Baking Cake 1

Module Description

This module introduces the learner to practical and applied aspects of cake making. It is designed to develop the learners' knowledge and understanding of cake, cake varieties, batter mixing, the skills and techniques involved in the production of a range of cake and the role of quality cake in enhancing the meal experience.

Module Aims

The aim of this module is to introduce the learner to the production methods and techniques used in the manufacture of cake and to provide the skills and practical understanding of the basic ingredients and their functions in quality cake production, both traditional and modern and to create an awareness of the emerging interest in speciality cakes and the field of baking arts.

Learning Outcomes

1. Identify ingredients used in this module and their technical characteristics.
2. Demonstrate an understanding of the importance of weighing, temperature and time control.
3. Identify baking equipment/ utensils and handle them safely and properly.
4. Demonstrate an ability to mix, aerate, portion, prepare receptacle, deposit and bake.
Demonstrate an ability to refine their range of manipulation skills and knowledge of technology.
5. Compare and contrast the balance of nutritional value, texture, flavour and colour in each item.
6. Demonstrate an understanding of the importance of selection, identification, preparation, combination, manipulation and processing, baking and presentation of the products.
7. Identify excellence in baking arts by developing their concepts and skills and develop finishing skills and presentation.

Indicative Content

Unit 1: Fundamentals: cake –making and methods using a range of basic ingredients including: flour, egg, sugar and fat. Madeira cake, Chocolate Chip Cake, Dundee Cake.

Unit 2: Introduction: Alternative cake making techniques, creams & fillings. Queen Cakes, Rum & Raisin Cake, Boiled Ginger Cake, Butter Cream & Glaze Icing.

Unit 3: Traditional Irish 1: Cake manufacture and traditional sponge introduction. Tin preparation and spreading techniques. Tea Brack, Pound Cakes, Chocolate Roulade.

Unit 4: Traditional Irish 2: Cake manufacture and traditional sponge introduction. Tin preparation and spreading techniques. Introduction to pastry and custard manufacture. Fresh fruit preparation for decoration. Porter Cake, Traditional Sponges, Sweet Short Paste, Pastry Creams.

Unit 5: Introduction to quick cakes: methods and Systems. Batter sizes, shapes, weights, finishes, use of vine fruits, bananas and vegetables. Banana Cake, Carrot Cake.

Unit 6: Festive Baking. Including preparation of fruits, currants, sultanas, glazed cherries, crystallized citrus fruits, almonds, beers and spirits. Tin and special baking preparatio. Traditional Christmas Cake, history and variations. Short crust pastry, luxury sweet mincemeat. Rich Christmas Cake

Unit 7: Festive Baking 2: Traditional Oxford Lunch, history and specifications. Frangipani quality and variations: Packaging and presentation for sale. Oxford Lunch, Mince Pies, Frangipani Production

Unit 8: Festive Baking 3: Traditional Christmas Pudding,- history, production and steaming methods. Hygienic handling and storage. Classic festival Biscuits, butter shortbread-history, production and marketing. Christmas Pudding and Butter shortbread production. Unit 9: Festival Cake Decoration 1: Traditional Almond Paste production, Mexican Paste use of color and artistic variations. Festive decorations. Use of specialized equipment. Almond pasting cake and decoration manufacture. Unit 10: Classic Decoration 2: Traditional Royal Icing and contemporary finishes. Presentation and packaging. Unit 11: Festive Fare 1: Alternative festive baking. Genoa Cake, frozen desserts, and Christmas White Pudding. Unit 12: Festive Fare 2: selection of petit fours & truffles, use of chocolate, marzipan and honey. German Christmas Biscuits and Lebkuchen.

Module Assessment

1 Continuous & 1 Summative Assessment.

Components	Percentage	Required
Assessment 1	50%	X
Assessment 2	50%	X
Examination		
Other		

Special Instructions

Continuous assessment: An assessment of the individual learners' performance over the period of the module. The learner will demonstrate an understanding of the alternative spectrum of ingredients used in pastry making and their characteristics, particularly the range of fats, sugars, fruits, nuts, chocolates, and flavours used. The learner will demonstrate an understanding of the methods used to incorporate fruits and nuts and how these ingredients can affect cake quality and will demonstrate their range of manipulation skills and knowledge of cake making technology.

Summative assessment: At the conclusion of the module the learner will present a selection of cakes from the products covered in the module. The learner is required to demonstrate a range of manipulative skills using best practice. The learner will demonstrate and critically evaluate the balance in the nutritional value, texture, flavour and colour. They will demonstrate an understanding of the importance of selection, identification, preparation, combination, manipulation and processing, batter aeration, baking and presentation. The learner must demonstrate an understanding of excellence in baking arts by developing their concepts and skills and finishing skills and presentation. The learner must demonstrate that they can identify and have become familiar with the various pieces of specialist equipment and utensils used in the production of these dough products including safety aspects.

Module Title

TFBK1024 Professional Baking Cake 2

Module Description

This module introduces the learner to the skills of advanced cake and cake making. It is designed to develop the learners' knowledge and understanding of specialty European confectionery, the advanced techniques involved in the production of a range of cake and the role of quality cake in enhancing the meal experience.

Module Aims

The aim of this module is to introduce the learner to the production methods and techniques used in the manufacture of (European) continental style cake and to provide the skills and practical understanding of the ingredients and their functions in quality cake production (both traditional and modern) and to create an awareness of the emerging interest in specialty cakes.

Learning and Teaching Methods

The focus will be on learner centred learning and development. The teaching methods will include lectures, practical demonstrations, class discussion and practical bakery laboratory work. Learners will be encouraged to undertake market research by visiting supermarkets, bakeries, visiting web sites and the library.

Indicative Content

Unit 1: Introduction to Advanced Confectionery:

Use preparation and storage of egg whites. Introduction to American confectionery, including specifications, range of ingredients and production. Meringues, Pavlova & Chocolate Brownies.

Unit 2: Introduction to Boiled Pastes:

Choux pastry- history and baking guidelines and precautions.

Profiteroles, Éclairs and Gateaux St. Honore

Unit 3: Introduction to Savoury Baking:

Savoury pastes and fillings –ingredients and specifications.

Hygiene importance and temperature control using meat products.

Production of a range of savoury pasties and pies.

Unit 4: Classic French Confectionery:

Use of nuts and cheeses in baking. Production of cream fillings using Fresh Cream & Chocolate Japonaise,

Cheese Cake & Ganache

Unit 5: Classic American Desserts

History and ingredient specifications, Lemon Meringue Pie & Banoffee Pie

Unit 6: German Torten & Desserts #1

Traditional German Torten –History and Varieties. German Apple Strudel

Unit 7: German Torten & Desserts #2

Classic Swartzwälder Kirsch Torte- History, Use of Cherries and Varieties. Use of Cream cheeses in manufacture of fillings. Use of tinned fruits. And fruit purees. Use of gelatine and types available.

Pineapple Cold Cheese Cake

Unit 8: Belgian Gateaux and Desserts #1

Classic Belgian Confectionery- History and ingredient range.

Production of Raspberry Rose Gateaux.

Unit 9: International Easter Baking

Use of marzipan in baking and decoration. Simnel cake

Classic Belgian Confectionery –Chocolate & Pear Gateaux

Use of Cream Liquors- Baileys Cold Cheese Cake

Unit 10: American and Austrian Classics

Devils Food Cake-Quick finishing techniques. Production of Filo Pastry – importance of careful handling & specifications. Austrian Apfel Strudel . Decoration of Simnel cake- variations of theme use of colour and icing for decoration.

Unit 11: Classic French Gateaux

Classic Butter Sponge. Praline source and manufacture. Boiled Butter creams and flavourings. Decorating techniques using creams.

Production of Coffee and Praline Gateaux.

Unit 12: Classic Swiss Torte

Use of ganache for decoration Nut based sponges. Sacher Torte- history & specification

Module Assessment

1 Continuous & 1 Summative Assessment

Components	Percentage	Required
Assessment 1	50%	X
Assessment 2	50%	X
Examination		
Other		

Special Instructions

Continuous assessment: An assessment of the individual learners performance in the bakery over the period of the module. The learner is required to demonstrate an understanding of the alternative spectrum of ingredients used in cake making and their characteristics, particularly the range of fats, sugars, fruits, nuts, chocolates, and flavours used. The learner must demonstrate an understanding of the methods used to incorporate fruits and nuts and the effect on cake quality and demonstrate their range of manipulation skills and knowledge of cake making technology.

Summative assessment: At the conclusion of the module the learner will present a selection of cakes. The learner will demonstrate that they have acquired a range of manipulative skills and ability to produce product to the appropriate quality using best practice. The learner will demonstrate a critically understanding of the balance of nutritional value, texture, flavour and colour. They must demonstrate an understanding of selection, identification, preparation, combination, manipulation and processing, batter aeration, baking and presentation of cake products. The learner must demonstrate an understanding of the various pieces of specialist equipment and utensils used in the production of dough products including safety aspects.

Module Title

TFBK2023

Professional Baking - Morning Goods & Biscuits

Module Description

This module introduces the learner to the applied skills of pastry and biscuit manufacture. It develops the learners' knowledge and understanding of pastry, biscuits and cookies, paste and batter mixing, the skills and techniques involved in the production of a range of pastries and the role of quality pastries in enhancing the meal experience.

Module Aims

The aim of this module is to introduce the learner to the production methods and techniques used in the manufacture of pastry and pastries and to provide the learner with the skills and understanding of the ingredients and their functions in quality pastry production, both traditional and modern and to create an awareness of the emerging interest in specialty pastries and in the field of baking and pastry arts.

Learning Outcomes

1. Identify ingredients used in morning goods and biscuits and their characteristics.
2. Demonstrate an understanding of the importance of weighing, temperature and time control.
3. Identify baking equipment/ utensils and handle them safely and properly.
4. Demonstrate an ability to mix, aerate, portion, prepare receptacle, deposit and bake.
5. Demonstrate an ability to achieve a balance of nutritional value, texture, flavour and colour in each item.
6. Critically evaluate and understand the importance of selection, identification, preparation, combination, manipulation and processing, baking and presentation of the products.
7. Demonstrate an understanding of the importance of hygiene and safety in the production of food.
8. Demonstrate a knowledge of classical patisserie and to pursue excellence in baking arts by developing their concepts and skills and develop finishing and presentation skills.

Learning and Teaching Methods

The focus will be learner active learning and development. The teaching methods will include lectures, practical demonstrations, videos, class discussion and practical bakery laboratory work. Students will be encouraged to undertake market research by visiting supermarkets, bakeries visiting web sites and the library.

Indicative Content

Unit 1: Introduction to morning goods

Scones-history ,varieties, ingredients, Chemical aeration and specifications. Production of Plain scones, Buttermilk Scones, Topsy roll.

Unit 2: Morning goods

Rock buns:- history ,varieties, ingredients, sweet & savoury, chemical aeration, enrichment levels and specifications. Production of variety of rock buns.

Unit 3: Traditional hot plate goods

Safety precautions using a hot plate. History of hot plate products specifications and batter mixing technology. Production of soda farls, pancakes , griddle bread and potato cakes.

Unit 4: American Sweet & Savoury Cake Muffins #1

Use of frozen fruits, spices, cheese and streusel-history and specifications

Production of apple, blueberry and chocolate cake muffins.

Unit 5: American Sweet & Savoury Cake Muffins #2

Use of seeds cheeses and nuts for enrichment & variation. Production of Cheese, lemon poppy seed and pecan muffins.

Unit 6: American Cookies.

Enrichment of ingredients variations and history of products. Production of peanut, white chocolate, chocolate & orange and classic American cookies.

Unit 7: Bakers Biscuits

Production methods, refrigeration, wire cutting and pinning techniques.

Production of Ginger, citron, and classical English shrewsbury biscuits.

Unit 8: Specialty Continental Bakers Biscuits.

Biscotti: history and variations. Swiss, German and Italian biscuit manufacture history. Selection and types of ingredients required. packaging details. Production of Biscotti, Mandelbrot, Cherry & Almond & Ameritti.

Unit 9: Classical Bakers Biscuits

History speciality ingredients and chocolate tempering techniques-specifications and technology. Production of Florentines, brandy snaps and flapjacks.

Unit 10: Vienesse and Piped Bakers Biscuits

Processing, piping, finishing and packaging. Batter handling and aeration techniques. Production of piped Vienesse, Dutch Spritz and Orange Biscuits.

Unit 11: Bakers Biscuit - Design and Decoration
Production of Tuille, lange de chat and boudoir biscuits.

Unit 12: Butter Shortbreads.

History , specifications and variations. Refridgeration ,pinning and blocking of shortbreads.Production of classic, chocolate and citron shortbreads.

Module Assessment

Continuous & Summative assessment

Components	Percentage	Required
Assessment 1	50%	X
Assessment 2	50%	X
Examination		
Other		

Special Instructions

An assessment of the individual learners' performance over the period of the module including: demonstrating an understanding of the characteristics of the ingredients and their technical characteristics; comparing and contrasting the various pieces of specialist equipment and utensils including safety aspects; Demonstrate an understanding of accurate weighing, time and temperature control and the importance of weighing, temperature and time control; must demonstrate an ability to mix, aerate, portion, prepare receptacle, deposit and bake. Summative assessment: At the conclusion of the module the learner will be required to present a selection of pastries and to critically evaluate the balance of the nutritional value, texture, flavour and colour. They must demonstrate a sound understanding of the importance of selection, identification, preparation, combination, manipulation and processing, batter aeration, baking and presentation of pastry products, and knowledge of classical patisserie; show an ability to pursue excellence in baking arts by developing their concepts, skills, finishing and presentation skills. The learner must demonstrate their knowledge of hygiene and safety in the production of food.

Module Title

TFBK2024 Professional Baking - Tarts & Pastries

Module Description

This module is designed to further develop the learner knowledge and understanding in the advanced techniques of the production of a range of specialty continental (European) pastry and patisserie, and the role of quality pastry in enhancing the meal experience.

Module Aims

The aim of this module is to further develop the skills of the learner in the production methods and techniques used in the manufacture of continental (European) style pastry and to provide the learner with the skills and practical understanding of the ingredients and their functions in quality pastry production, both traditional and modern and to create an awareness of the emerging interest in specialty pastry and in the field of baking and pastry arts.

Learning Outcomes

1. Identify ingredients used in morning goods and biscuits and their characteristics.
2. Demonstrate an understanding of the importance of weighing, temperature and time control.
3. Identify baking equipment/ utensils and handle them safely and properly.

4. Demonstrate an ability to mix, aerate, portion, prepare receptacle, deposit and bake.
Demonstrate an ability to refine their range of manipulation skills and knowledge of technology.
5. Compare and contrast the balance of nutritional value, texture, flavour and colour in each item.
6. Demonstrate an understanding of the importance of selection, identification, preparation, combination, manipulation and processing, baking and presentation of the products.
7. Identify excellence in baking arts by developing their concepts and skills and develop finishing skills and presentation.

Learning Outcomes

1. Identify ingredients used in morning goods and biscuits and their characteristics.
2. Demonstrate an understanding of the importance of weighing, temperature and time control.
3. Identify baking equipment/ utensils and handle them safely and properly.
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6. Demonstrate an understanding of the importance of selection, identification, preparation, combination, manipulation and processing, baking and presentation of the products.
7. Identify excellence in baking arts by developing their concepts and skills and develop finishing skills and presentation.

Learning and Teaching Methods

The focus is on learner active learning and development. The teaching methods will include lectures, practical demonstrations, videos, class discussion, and practical bakery laboratory work. Learners will be encouraged to undertake market research by visiting supermarkets, bakeries using web sites and the libraries.

Indicative Content

Unit 1:Tarts & Slices #1
Short Crust Pastry and flaky pastry technology. Ingredient selection and specifications. Pastry precautions and handling techniques
Production of Classic Traditional Irish Apple TartS. Paradise slices.

Unit 2:Tarts & Slices #2
Tin lining techniques and selection and preparation of fresh tart fruits. Production of Rhubarb tart. Bake well tart and Maid of honour tartlets

Unit 3: Tarts & Slices #3
History of tarts and use of almond and other nut products in pastries.
Caramel production and technology. Production of: Dutch Apple Tart
Congress Tartlets, Chocolate Caramel Slices

Unit 4 Classic French Tarts
Cherry Clafoutis Tartlets, Almond Slices, Citron Tart.

Unit 5: Classic American Tarts
History and ingredient selection for American pastry products.
Production of Pecan –Whiskey Pie. Coconut slices. Apple & Apricot Tart

Unit 6: Introduction to Puff Pastry.
Lamination techniques ingredient selection and puff pastry technology
Use of trimmings. Production of Turnovers. Eccles Cakes

Unit 7: Advanced French Pastry #1
French patisserie history and technology. Palmiers. Slice lines . Cream Horns

Unit 8: Advanced French Pastry # 2
Theory of Pastry aeration and importance of uniform thickness
production of classical patisserie. Baton Glaze. Mille Feuille & Pithiviers.

Unit 9: Viennoiserie #1
Theory of use of Brioche in manufacture of Classic French Patisserie
Production of Apple & almond , blueberry pastries

Unit 10: Viennoiserie # 2
Theory of Croissant Dough in manufacture of classic French Pastry.
Dough lamination & refrigeration precautions. Production of Pear & chocolate, baileys tartlets.

Unit 11: Swiss Classic Pastries
History of product development and innovation at the Richemont School, Lucerne, Switzerland. Mirleton tartlets.
Chocolate & Hazelnut Slices. Cheese Tarts.

Unit 12: Filo Pastry
Theory; Production and handling techniques. Production of Classic Greek Pastry Baklava. Filo Fruit Parcels

Module Assessment

1 Continuous & 1 Summative Assessment

Components	Percentage	Required
Assessment 1	50%	
Assessment 2	50%	
Examination		
Other		

Special Instructions

Continuous assessment: An assessment of the individual learners' performance over the period of the module including: The learner is required to demonstrate an understanding of the specific characteristics of the ingredients used their technical characteristics; The learner must be capable of comparing and contrasting the various pieces of specialist equipment and utensils including safety aspects; Demonstrate an understanding of accurate weighing, time and temperature control and an understanding of the importance of weighing, temperature and time control; must demonstrate an ability to mix, aerate, portion, prepare receptacle, deposit and bake.

Summative assessment: At the conclusion of the module the learner will be required to present a selection of pastries and to critically evaluate the balance of the nutritional value, texture, flavour and colour in each product. They must demonstrate that they have a sound understanding of the importance of selection, identification, preparation, combination, manipulation and processing, batter aeration, baking and presentation of pastry products, and demonstrate their knowledge of classical patisserie and show that they have the ability to pursue excellence in baking arts by developing their concepts, skills, finishing and presentation skills. The learner must demonstrate their knowledge of hygiene and safety in the production of food.

Module Title

TFBK2026 Professional Baking – Sweet Breads 1

Module Description

This module will focus on the basic techniques of sweet bread dough production. It is designed to further develop the learners' knowledge and understanding of the production methods and techniques used in the manufacture of dough and a range of sweet breads.

Module Aims

The aim of this module is to introduce the learner to the methods and techniques applied in the production of a range of sweet bread products and provide them with a knowledge and practical understanding of the techniques and ingredients used. A range of Irish British sweet dough products together with European (Continental) specialties will be included to further expand the learners awareness of the emerging interest in specialty sweet breads and in the field of baking arts.

Learning Outcomes

1. Identify the ingredients used in the production of enriched yeast raised products and comprehend their specific characteristics.
2. Demonstrate an understanding and appreciate of the methods of incorporation of fats, sugars, spices and other yeast inhibitors and their effect on fermentation, dough development and structure.
3. Compare and contrast the history, origins and significance of the various international specialties.
6. Demonstrate an understanding of the importance of hygiene and safety in the production of food.
7. Demonstrate an appreciation and understanding of the importance of accurate weighing, measuring, portioning, time and temperature control.

8. Critically evaluate the various pieces of specialist equipment and utensils used in the production of sweet dough products including any safety aspects.
 9. Demonstrate a comprehension of the importance of product quality and best practice.
- 2.

Learning and Teaching Methods

The focus will be on learner centered learning and development. The teaching strategies will include lectures, practical demonstrations, class discussion and practical bakery laboratory work. The students will be encouraged to undertake market research by visiting bakeries, supermarkets, web sites and the library.

Indicative Content

Unit 1. Fundamentals of Sweet Dough and Breads:

Dough mixing technique and ingredient range including: Flour; Salt; Yeast; Sugars and Fats. Cookie Buns, Swiss Buns, Fruit Buns, Cherry Buns, Bun Glaze, Water Icing.

Unit 2. Sweet Dough and Breads #1

Range of enriching ingredients used – butter; dried vine fruits; Piping and crossing techniques. Iced Logs, Hot Cross Buns, Crossing Mix.

Unit 3. Sweet Dough and Breads #2

Chelsea Buns - production and fabrication techniques. Butter Buns – history, enrichment techniques; Irish Barm Brack – history, tradition, variations, quality specifications.

Unit 4. Sweet Dough and Breads #3

History and religious connections. Regional specialties. Sally Lunn, Five String Rum and Raisin Plait.

Unit 5. Enriched dough and products

Use of nib sugar, high levels of butter and eggs, Sugar syrups and flavourings. Savorins, Rum Babas, Baba Syrup, Bath Buns.

Unit 6. Laminated Dough and Products.

Use of combination of sweet dough and puff pastry. Lamination techniques. Product varieties. Production, processing, baking and finishing techniques. Belgian Bun Varieties.

Unit 7. Danish / American Pastry Specialties

Rich laminated pastry, nut mixtures and fillings. History and American connection. Production techniques. American Kringle, Pecan Nut Plait.

Unit 8. French Pastry Specialties.

Types and use of lamination butter. Rolling techniques, flakiness, volume, history. French chocolate pastry – chocolate specifications. Croissant, Pain au Chocolate.

Unit 9. Danish Pastry #1

Production of yeasted pastry dough. Lamination techniques. Use of egg and butter – specifications. Unique character of product. Small Danish Pastry Varieties, Fillings, Pastes and Icings.

Unit 10. Danish Pastry #2

Manufacture of larger products including Apple Strudel, Chocolate and Hazelnut pastries. Use of trimmings.

Unit 11. International Specialties #1

Five string Rum and Raisin Plait. Greek Christmas Bread – use of spice. Decoration with Byzantine Cross.

Unit 12. International Specialties #2

Eastern European and Scottish specialties. Christmas breads and Selkirk bannock.

Module Assessment

1 Continuous & 1 Summative assessment

Components	Percentage	Required
Assessment 1	50%	
Assessment 2	50%	
Examination		
Other		

Special Instructions

Continuous assessment: This will comprise an assessment of the individual learners' performance in the bakery over the period of the module. The student is required to demonstrate the ability to identify the ingredients used in the production of enriched yeast raised products and comprehend their specific characteristics. Demonstrate an understanding and appreciate of the methods of incorporation of fats, sugars, spices and other yeast inhibitors and their effect on fermentation, dough development and structure. The student must be capable of comparing and contrasting the various pieces of specialist equipment and utensils used in the production of the bread products covered in this module, including any safety aspects, and also to demonstrate an understanding of the importance of accurate weighing, time and temperature control.

Summative assessment: At the conclusion of the module the learner will be required to present a selection of sweet breads and demonstrate an ability to compare and contrast the history, origins and significance of the various international specialties and an understanding of accurate weighing, measuring, portioning, time and temperature control. The learner will evaluate the specialist equipment and utensils used in the production of sweet dough products including safety aspects. The learner must demonstrate a range of manipulation skills and knowledge of the science and technology involved and demonstrate an understanding of the importance of product quality and best practice and demonstrate a clear understanding of the importance of hygiene and safety in the production of food must be demonstrated.

Module Title

TFBK2025 Professional Baking – Sweet Breads 2

Module Description

This practical module will focus on the advanced techniques of sweet bread production. It is designed to build on and further expand the learners' skills and knowledge of sweet breads their origins, and the role of bread in society and in enhancing the meal experience.

Module Aims

The aim of this module is to introduce the learner to the production methods and techniques of an advanced range of sweet bread dough products from both Ireland and the UK together with some continental (European) and world specialties and to create an in depth understanding and appreciation of the art of bread making.

Learning Outcomes

1. Identify the ingredients used in the production of enriched yeast raised products and understand their specific characteristics.
2. Demonstrate an understanding and appreciation of the methods of incorporation of fats, sugars, spices and other yeast inhibitors and their effect on fermentation, dough development and structure.
3. Demonstrate an appreciation of the methods of incorporation of fruits and nuts and how these can effect the fermentation, dough development and the final dough structure.
4. Demonstrate and refine their range of manipulation skills and knowledge of the science and technology involved.
5. Compare and contrast the history, origins and significance of the various specialties.
6. Identify and be familiar with the various pieces of specialist equipment and utensils used in the production of these sweet dough products including any safety aspects.
7. Demonstrate and understand the importance of product quality and best practice.

Learning and Teaching Methods

The focus will be on learner centered learning and development. The teaching methods will include lectures, practical demonstrations, class discussion and practical bakery laboratory work. The students will be encouraged to undertake market research by visiting bakeries, supermarkets, web sites and the library.

Indicative Content

Unit 1. Introduction to Advanced Sweet Dough:

Karlsbrod – Swedish Festival Bread (wreath). Production techniques, history. Doughnuts - 8 varieties, history, production techniques, safety aspects.

Unit 2. International Sweet Dough Specialties –Germany #1:

Kugelhopf- Uniquely shaped rich yeasted fruit bread. Baking and finishing. Traditional German Christmas Stollen, a National specialty.

Unit 3. International Sweet Dough Specialties – Italy :

Pannetone very rich, light fruited Christmas specialty, History and production techniques. Pain al Ciccolato, use of chocolate in baking.

Unit 4. International Sweet Dough Specialties – Austria and Wales:

Almond Ring – manipulation techniques, use of nut fillings and finishing techniques. Bara Brith – rich fruited bread from Snowdonia.

Unit 5. International Sweet Dough Specialties – Holland.

Dutch coffee Cake – History and manipulation techniques. Dutch Sugar Bread – Use of sugar crystals, proofing and baking.

Unit 6. International Sweet Dough Specialties - England and Germany:

Saffron Loaf, a rich saffron colored and flavored fruit loaf from Cornwall. History, use of saffron, production techniques. Quark Cheese Slice – use of fresh cheese fillings and their alternatives. Bee Sting Slice – use of boiled sugar, finishing techniques.

Unit 7. International Sweet Dough Specialties – Germany #2:

Hazelnussopf – history, use of nut fillings, dough manipulation techniques, Butter Slice – finishing techniques and use. Apple Pockets – use of fresh sweet apple filling.

Unit 8. International Sweet Dough Specialties – USA and Germany :

Butterscotch and Pecan Buns – use of liquid sugars, finishing techniques Cherry Slice, Strusel Biscuits – manufacture and use of butter strusel.

Unit 9. International Sweet Dough Specialties –England and Switzerland

Malt Bread – the use and effect of barley malt on fermentation and baking. Chocolate Easter Bunny – use of cake fillings, dough manipulation techniques.

Unit 10. International Sweet Dough specialties - Denmark

Julekage–history, use of various glaze fruits and cardamom spice. Production techniques. Pineapple and Coconut Stollen – the use of sweet fillings, rich dough manipulation and baking.

Unit 11. International Sweet Dough Specialty –Germany and Switzerland

Strusel Slice- German specialty slice line. Macaroon Stollen- rich almond Swiss specialty

Unit 12. International Sweet Dough Specialties-France and Switzerland

Couronne Nicoise – ring shaped brioche containing glaze fruits. Grittbanzen – novelty shaped figures

Module Assessment

1 Continuous & 1 Summative Assessment

Components	Percentage	Required
Assessment 1	50%	
Assessment 2	50%	
Examination		
Other		

Special Instructions

Continuous assessment: This will comprise an assessment of the individual learners' performance over the period of the module. The learner is required to: identify the ingredients used in the production of enriched yeast raised products and understand specific characteristics; demonstrate an understanding and appreciation of the methods of incorporation of fats, sugars, spices and other yeast inhibitors and their effect on fermentation, dough development and structure; demonstrate an understanding and knowledge of the importance of hygiene and safety in the production of food.

Summative assessment: At the conclusion of the module the learner will present a selection of sweet breads from the products covered in this module. He/she must demonstrate a refined range of manipulation skills and

knowledge of the science and technology involved. They must demonstrate the ability to compare and contrast the history, origins and significance of the various sweet bread specialties. Demonstrate that they have acquired the range of manipulative skills and ability to produce product to the highest quality using best practice. The learner must demonstrate that they can identify and have become familiar with the various pieces of specialist equipment and utensils used in production including safety aspects and demonstrate an understanding of product quality and best practice.

Module Title

TFBK1022 Baking Ingredient Studies 1

Module Description

This module focuses on the wide range of raw materials used in the manufacture of baked products including the sources and properties. It includes processing details for each material, classifications and specifications, together with the use and suitability of each material in the manufacture of baked product.

Module Aims

To enhance the professional and personal development of the learner in understanding and appreciation the raw materials and ingredients used in the manufacture of baked product.

Learning Outcomes

1. Identify the range of raw materials covered in this module, their characteristics, specifications and suitability for use in the manufacture of bread, cake and pastry.
2. Demonstrate an understanding of the properties and specific uses of the raw materials and ingredients covered in this module
3. Critically evaluate the importance of these raw materials and ingredients.
4. Compare and contrast the importance of the acid / alkali reaction (baking powders) and its significance in cake and pastry aeration.
5. Demonstrate an understanding of the importance of water in bread and cake and the significance of the water absorbing capacity of different flours and other materials.
6. Compare and contrast the forms of sweetening agents and their use in bread and cake manufacture.

Learning and Teaching Methods

The focus will be on learner active learning and involvement. Teaching strategies will include class room lecture, tutorials, discussion, use of video, WebCT, and the internet.

Indicative Content

Unit 1: Wheat Introduction to the variety of wheat and other cereals used in food manufacture.
Unit 2: Flour: The composition, specifications and suitability of wheat and other cereal flours.
Unit 3: Salt Use and function of salt in bread and other baked products and its nutritional aspects.
Unit 4: Yeast Bakers yeast, its composition and reproductive cycle. Its use in brewing, distilling and baking. Manufacture of commercial yeasts and types available. Other biological leavening systems.
Unit 5: Water The sources and treatment of water for industrial and human consumption. Its functional properties in baked goods.
Unit 6: Sugars : The various sources, refining and processing of sugar and other sweetening agents. Function and use in baked products. Substitute sweeteners and their specific uses.
Unit 7: Baking Powders Chemical aerating agents – history and sources. Use of acids and alkalis in the aeration of baked products. Types and function of various baking powders.
Unit 8: Dairy Products Types available, specifications, use and specific functions in baked goods.
Unit 9: Fats and Oils Use of edible oils and fats. Refining process and fat manufacture. Use and functions.
Unit 10: Jams Type, range and quality variations of jams, curds and sweet mincemeats. Use and functions in baked products.
Unit 11: Egg and Egg Products: Availability, specifications, use and specific functions in baked goods. Hygiene and care.

Unit 12: Soya Source and processing of Soya products. History and purpose of use in baked products. Specifications and characteristics. Recent developments including GMS.

Module Assessment

2 Assessments & 1 Exam.

Components	Percentage	Required
Assessment 1	20%	
Assessment 2	20%	
Examination	60%	

Special Instructions

Assessment 1 (individual): The learner is required to research a particular raw material and present an individual piece of written work not exceeding 2000 words, excluding references and appendices. The learner is required to examine and assess the particular material selected and report on the source, variety, variations, availability, specifications and uses in the manufacture of baked products

Assessment 2 (group): The class will be divided into groups of 3 or 4 students. Each team will be expected to demonstrate their ability to research and critically identify and assess a particular raw material and its use in the manufacture of baked products and food products generally. The team will be expected to present the results of their research to their peers in an informal class environment. Each team will have access to the reports produced by the other teams. Report will not normally exceed 3000 words, excluding references, appendices and presentation material.

Examination: The written examination will centre on the learners' knowledge, understanding and comprehension of the raw materials and ingredients covered in this module, their classification and specification and their suitability for use in the manufacture of baked product.

Module Title

TFBK2022 Baking Ingredient Studies 2

Module Description

This module will continue the focus on the wide range of raw materials used in the manufacture of baked products. The module will cover the sources and properties of the particular material. It will include processing details for each material, their classifications and specifications. The module will also cover the use and suitability of each material in the manufacture of baked product

Module Aims

To further develop and enhance the professional and personal development of the learner in understanding and appreciation of the raw materials and ingredients used in the manufacture of baked product.

Learning Outcomes

1. Identify the range of raw materials covered in this module, their characteristics, specifications and suitability for use in the manufacture of bread, cake and pastry.
2. Demonstrate an understanding of the properties and specific uses of the raw materials and ingredients covered in this module
3. Critically evaluate the importance of these raw materials and ingredients.
4. Compare and contrast the importance of the various forms of enzymes used in the manufacture of baked products and other foods.
5. Demonstrate an understanding of the importance and significance of genetically modified Soya

products in fermentation, breadmaking and cake / pastry manufacture.
6. Compare and contrast the forms of preservatives and their use in shelf life extension.

Learning and Teaching Methods

The focus on learner active learning and involvement. Teaching strategies will include class room lecture, tutorials, discussion, use of video, WebCT, and the internet.

Indicative Content

Unit 1: Flour Improvers & Dough Conditioners:

An introduction to the type and variety of flour improvers and conditioners. Their function and use. The historical reasons for their use and consumer concerns.

Unit 2: Flour Bleaching:

Historical reasons for use. Function of chemical bleaching agents. Types in use. Legislation governing use.

Consumer resistance. Traditional flour bleaching methods.

Unit 3: Fruits:

Source, composition and processing of fruits used in baking. Variety available and specific use. Nutritional and product enrichment. Shelf life extension ability. Role as fat replacement

Unit 4: Nuts and Nut Products:

Source, composition and processing of nuts used in baking. Nut based products. Nutritional and enrichment abilities. Strict stock rotation. Nut free products.

Unit 5: Malt Products:

Source, composition and importance of malt. Types available. Use and function in traditional and modern breadmaking. Diastatic / non diastatic enzymes in dough development and bread.

Unit 6: Soya Products:

Source, composition and importance of Soya as a food. Its importance in baked products. Use as flour bleach. Its functional advantages. Genetically modified Soya and concerns.

Unit 7: Emulsifying Agents:

Source, composition and importance of emulsions and emulsifying agents in food. Types in use. Functional aspects. Product improvements and shelf life extension.

Unit 8: Gums, Starches and Jellying Agents:

Sources, composition and processing. Importance in food industry. Types available. Use and function in food manufacture.

Unit 9: Flavours and Spices:

Source, composition and history of use. Functional properties and product enhancement abilities. Food regulations governing use. Types and specific uses.

Unit 10: Chocolate and Cocoa:

Source, composition and processing of Cocoa Bean. Historical importance of chocolate. Bean variety and Chocolate types. Functional properties and tempering process. Quality standards .

Unit 11: Enzymes:

Functional properties. Historical and recent developments. Use in traditional and modern breadmaking systems. Recent and future developments in field of Enzyme technology.

Unit 12: Preservatives:

Source, composition and types of commonly used preservatives in food manufacture. Ability to influence product shelf life. Regulation governing use. Consumer concerns and trends in consumer reactions to use in food.

Module Assessment

2 Assessments & 1 Exam

Components	Percentage	Required
Assessment 1	20%	
Assessment 2	20%	
Examination	60%	

Other		
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Special Instructions

Assessment 1 (individual): The learner is required to research a particular raw material and will be examined on an individual piece of written work not exceeding 2000 words, excluding references and appendices. The learner is required to research, examine and assess the particular material and write a report on the source, variety, variations, availability, specifications and uses in the manufacture of baked products

Assessment 2 (group): The class will be divided into teams. Each team will be expected to demonstrate their ability to research and critically identify and assess a particular raw material and its use in the manufacture of baked products and food products generally. The team will be expected to present the results to their peers in a class environment. Each report will not normally exceed 3000 words, excluding references, appendices and presentation material.

Examination: The written examination will centre on the learners' knowledge, understanding and comprehension of the raw materials and ingredients covered in this module, their classification and specification and their suitability for use in the manufacture of baked product.

Module Title

TFBK1025 Baking Technology 1

Module Description

The baking industry has witnessed many changes over the past 25 years, including rationalization, market segmentation and production automation. Recent market influences include a 'back to the future' concept. This module focuses on the technology of baking and the on the theory and science of baking. It includes a critical examination of the various bread making and fermentation systems and pastry manufacture with emphasis on product quality.

Module Aims

This module aims to provide the learner with a knowledge, understanding and appreciation of the technology involved in the manufacture of baked product, including dough and bread, batter mixtures and cake and pastry.

Learning Outcomes

1. Compare and contrast the fundamentals of bread, cake and pastry making processes.
2. Identify different techniques and science in dough mixing, kneading, lamination and processing.
3. Demonstrate an understanding of the different breadmaking processes, including the historical origins of the natural fermentation, mechanical and activated development processes.
4. Demonstrate an understanding of the different fermentation and aeration methods and their use.
5. Comprehend the different manipulation techniques used in processing dough.
6. Comprehend and contrast the importance of recipe formulation, recipe balance, the functions and appropriate use of dough conditioners and additives.
7. Demonstrate an understanding of the different types of pastry and pastry manufacturing processes, including the process of lamination and its associated aeration abilities.

Learning and Teaching Methods

The focus will be on learner active learning and involvement. Teaching strategies will include: lectures; tutorials; discussion and debate; use of videos; WebCT and the internet

Indicative Content

Unit 1: History of Bread: An introduction to the development of leavened bread from the time of its development in ancient Egypt. European Breads: A detailed overview of the types of breads manufactured in European countries. Bread consumption trends in Europe - Britain / Ireland. Bread marketing.

Unit 2: Industry Structure: Overview of bakery type; Plant / Craft / Retail / Wholesale / Scratch; Industry production capacity; Bread, Cake and Pastry consumption trends;

Unit 3: Breadmaking Processes: Range and variety of bread manufacturing processes used in Ireland, Ireland and rest of world.; Comparison of various methods. Traditional and Modern

Unit 4: Recipe Formulation: Bread formulae and recipe construction; Function of primary raw materials; Formula variations;

Unit 5: Ingredient Preparation: Importance of planned and systematic system; Outline of accepted best practice; Specific problems ; Raw material information and care;

Unit 6: Compound Dough Conditioners: Advantages/ Disadvantages of use of chemical / functional materials; Historical background; Outline of types, usage, legislation and effects.

Unit 7: Dough Processing : Dough Dividing Systems; Intermediate Proofing; Final Moulding; Final Proofing; Baking and Oven conditions; Cooling. Large and small operations

Unit 8: Bulk Fermentation Process: History and technology of process; Application; Operation; Equipment; Advantages and disadvantages;

Unit 9: Mechanical & Activated Development Processes: Historical origins; Introduction in Ireland; Application; Formula re-formulation; Equipment; Advantages and disadvantages;

Unit 10: Fermentation and Dough Development: Technology of dough fermentation and control; Influence of Ingredients; Factors that influence dough development; Natural / artificial oxidation of dough;

Unit 11: Short Pastry: Types; Mixing methods; Ingredients; Formulation range; Recipe Balance and rules; Calculations; Shortness; Savory variations; Recipe formulations.

Unit 12: Laminated Pastry: Types; Manufacture; Fat and flour specifications; Pastry aeration; Lamination systems; Pastry sheeting and layering; Utilization of trimmings;

Module Assessment

1 Assessment & 1 Exam

Components	Percentage	Required
Assessment 1	40%	
Assessment 2		
Examination	60%	
Other		

Special Instructions

Assessment 1 (individual): The learner will be required to research, examine and assess a particular aspect of baking technology and write a report on their findings. The student will be examined on this individual piece of written work not exceeding 2000 words, excluding references and appendices.

Assessment 2 (group): The class will be divided into groups of 3 or 4 students. The group will work as a team. Each team will be expected to demonstrate their ability to research and critically identify and assess a particular area of baking technology and its application in the manufacture of baked products and food products generally. The team will be expected to present the results of their research to their peers in an informal class environment. Each team will have access to the reports produced by the other teams. Each report will not normally exceed 3000 words, excluding references, appendices and presentation material.

Examination: The written examination will centre on the learners knowledge, understanding and comprehension of the theory and science of baking technology as covered in this module.

Module Title

Module Description

This module deepens the knowledge of baking technology with a focus on the on the theory and science of baking. It will include a critical examination of the cake, sponge and pastry technology, part bake technology, product enrichment, dough retardation, French bread and sour dough technology.

Module Aims

This module aims to develop further the learners understanding of the technology involved in the manufacture of baked product, including dough and bread, batter mixtures and cake, and pastry. Learners will be encouraged to apply the knowledge developed in this module with the ingredient studies modules combined with the experience gained in the practical and applied baking modules, in the research, design and production of new products.

Learning Outcomes

1. Demonstrate an understanding and appreciation of the history, technology, characteristics, specifications of cake sponge and pastry manufacture.
2. Critically evaluate the techniques and science of cake recipe balance.
3. Demonstrate an understanding of fried dough technology and the processes involved in the manufacture of the product.
4. Compare and contrast the different aeration methods used in sponge cake production.
5. Compare and contrast the enrichment techniques used in product manufacture.
6. Demonstrate an understanding of the function, significance and use of part baking technology in the production of breads.
7. Demonstrate an understanding of the historical origins and use of retarding technology; French bread and sour dough technology.

Learning and Teaching Methods

These will include: lecture; tutorials; discussion and debate; videos, use of the internet, use of library

Indicative Content

Unit 1: Cake Manufacture: History and type of cake. Characteristics and specifications. Function of ingredients. Mixing systems and importance of temperature control. Cake methods.

Unit 2: Cake Technology: Detailed overview of the ingredients; Formulae range; Fruit to batter ratio; Batter - aeration and setting; Factors governing quality control; Baking.

Unit 3: Cake - Recipe Balance: Overview of rules that apply to balanced formulae; Range of formula; Recipe balance - traditional and modern cake; Balancing exercise

Unit 4: Fried Dough Technology: History, range and variety of fried dough products; Frying medium and methods; Equipment; Importance of smoke point. Quality control and care of oil / fats.

Unit 5: Sponge Cake Technology: Product range and recipe construction; Function of primary ingredients; Formula variations; Production techniques and processing details.

Unit 6: Classification of Baked Products - Glossary: Definitions of terminology; Dough rheology; Range of product types and details of each classification;

Unit 7: Product Enrichment: Morning Goods / Snacks; Enrichment classification and range of products; Sales trends; Formula and processing changes. Product comparisons;

Unit 8: Baked Product - Flavour: Definitions; Taste senses; Influence of ingredients; Flavour synonymous with products; Essential oils and spices; Food flavour;

Unit 9: Part Baking Technology: History and technology of process; Application; Operation; Equipment; Advantages / disadvantages; Freezing and storage; bake off procedures; Sales trends;

Unit 10: Retardation Technology: Historical origins; Purpose of process and equipment; Product range and recipe formulation. Importance of quality control at each stage;

Unit 11: French Bread Technology: Historical overview; Types; Mixing methods; Ingredients; Formulation range; Recipe Balance and rules; Calculations;

Unit 12: Sour Dough Technology: Historical overview; Sours and cultures Bread types; Importance of dough pH control. Manufacture of sour and procedures; Flavour enhancement; Storage and control;

Module Assessment

2 Assessments & 1 Exam

Components	Percentage	Required
Assessment 1	20%	
Assessment 2	20%	
Examination	60%	
Other		

Special Instructions

Assessment 1 (individual): The learner will be required to research, examine and assess a particular aspect of baking technology and write a report on their findings. The learner will be examined on this individual piece of written work not exceeding 2000 words, excluding references and appendices.

Assessment 2 (group): The class will be divided into groups of 3 or 4 students. The group will work as a team. Each team will be expected to demonstrate their ability to research and critically identify and assess a particular area of baking technology and its application in the manufacture of baked products and food products generally. The team will be expected to present the results of their research to their peers in an informal class environment. Each team will have access to the reports produced by the other teams. Each report will not normally exceed 3000 words, excluding references, appendices and presentation material.

Examination: The written examination will centre on the learners knowledge, understanding and comprehension of the theory and science of baking technology as covered in this module.

Module Title

TFBK2027 Quality Assurance Management in Baking

Module Description

Quality Assurance Management is a strategic issue that embraces leadership, innovation and learning with focus on the achievement of excellence. The module gives the learner an in depth understanding of the concepts of quality assurance in the baking and associated food industries.

Module Aims

This module aims to enhance the professional and personal development of the learner in understanding the role of quality assurance as an essential tool for bakers, food manufacturers and food retailers

Learning Outcomes

On successful completion of this module the learner will be able to:

1. Critically evaluate the concepts, theories and analytical tools in the field of quality assurance.
2. Demonstrate an understanding of the aims and principles of a quality control system.
3. Identify the benefits of operating a Quality Assurance system in the workplace.
4. Demonstrate an understanding of HACCP in a food manufacturing company..
5. Apply appropriate concepts, theories and analytical tools in developing and preparing a bakery quality assurance system.

Learning and Teaching Methods

The focus is on learner active learning and involvement. Strategies will include class lectures, tutorials, debate, group discussion and case studies.

Indicative Content

Unit1: Introduction to Quality: Definitions. Introduction to Quality standards.
 Unit 2: Historical background; ISO, FSAI. BRC. BS 5750. How standards are drawn up. Introduction to the BRC, make up and uses. Background to the introduction and development of ISO BS 5750 and Quality related organizations.
 Unit 3: Quality related costs and benefits; Cost of failure, preventative costs, Benefits of quality control; Objectives of a quality system.
 Unit 4: Aims and principles of International standardization; New thinking on Quality, the changing emphasis of Quality.
 Unit 5: The beneficial effects of Quality improvement. Customer satisfaction, Waste reduction, Efficient based Quality procedures. International recognition. Economics to production. Complete records for traceability.
 Unit 6: Quality Certification / Registration procedure. The users of Quality systems. Keeping the system effective.
 Unit 7: ISO clauses 1-6 Quality System Requirements; Quality System;
 Unit 8: ISO clauses 7-12 Contract Review; Design control; Document & Data Control,
 Unit 9: Requirements of ISO clauses 13–20; Purchasing; Control of customer supplied product; Product identification & traceability; Process Control; Inspection and testing; Control of test equipment; Inspection and test status; Control of non-conforming product, Corrective and preventative action; Handling to delivery;
 Unit 10: Auditing Purpose of audits, responsibilities, preparation, suitable personnel, Quality Control Records; Internal Quality Audits, Training,. Error / defect prevention,
 Unit 11: Types of Audits, Internal, External & Extrinsic auditing. HACCP Definition of terms , Introduction & history, Benefits and Scope.
 Unit 12: Revision and review

Module Assessment

1 Assessment & 1 Exam

Components	Percentage	Required
Assessment 1	40	
Assessment 2		
Examination	60	
Other		

Special Instructions

Assessment: An individual piece of written work on quality assurance chosen by the lecturer and learner. The learner will be expected to demonstrate an ability to identify and critically evaluate an element of quality assurance as it is applied to the baking/food industry. The learner will be required to present a report on their assignment of 2000 words not including references and appendices.

Module Title

TFBK3021 Bakery Operations Management

Module Description

This module focuses on the management tools available to the production/plant manager and supervisor. These include plant maintenance, work study techniques, production and manufacturing costs, staff rostering, principals and practice of supervision, production planning. There is a strong focus on the achievement of excellence.

Module Aims

This module aims to enhance the professional and personal development of the learner in developing a specialized managerial knowledge of production planning and productivity improvement techniques.

Learning Outcomes

1. Demonstrate a critical understanding of the principles and practices of planned maintenance.
2. Evaluate the legal requirements for equipment and plant safety.
3. Critically evaluate the concepts of work study and techniques and their application.
4. Utilise diagnostic skills in developing and evaluating product schedules, production control systems and effective stock control
5. Demonstrate an understanding of the importance of training and staff morale.
6. Exercise appropriate judgement in developing an effective waste management operation.

Learning and Teaching Methods

The focus is on learner centred active learning and involvement.

Strategies will include class lectures, tutorials, debate, group discussion and case studies.

Indicative Content

Unit 1: Operations Management: Concept and theory. Organization, systems approach (input –process-outputs). Productivity (efficiency and effectiveness). Human Resources; Capital; Information: Inputs-Outputs; Production levels and improvements; Competition and quality factors.

Unit 2: Production Planning: Quality Systems; Plant Location; Capacity Levels; Operation Layout; Process Design and Equipment.

Unit 3: Capacity Planning: Size of Operation; Excess Capacity- cost factor: Insufficient Capacity- lost sales; Accurate Forecasting; Product Life Cycle; Economies of Scale: Big is better, small means flexibility; Production Patterns and Seasonality; Shift Work Pattern.

Unit 4 & 5: Facility and Plant Layout: Design of the physical arrangement of production equipment within the facility; Ideal Situations; Case Studies. Effective utilization of space and labour; Minimization of material handling; Flexibility to accommodate future changes in product and / or demand. Process layout – by function; Product Layout- continuous product; Mixed layout- flexibility: Fixed position layout.

Unit 6: Planned Maintenance: Scheduling plant and maintenance checks; advantages and disadvantages of permanent / contract labour; decision to purchase / lease equipment; safety legislation.

Unit 7: Distribution Planning: Dispatch Department Management;

Ordering and dispatch of product; logistics of distribution; status of product (ambient, chilled or frozen); legislation relation to transport of food products.

Unit 8: Stock Control: Efficient ordering system; Correct storage; Re-ordering levels; Rotation of stock; Stock taking and Stock reconciliation against production.

Unit 9: Waste Control: Identifying waste and how it occurs; Breaking it down into components such as waste from production and from stock deterioration; Eliminating this by implanting proper process control standards and stock rotation; Recycling production waste if possible into other products.

Unit 10: Training: staff training; Types of training; Costs of training; Effects of training on staff morale and Working with training authorities.

Unit 11: Process Control: Design of bakery equipment; Cost of purchase; Operation functions; Purpose of process and equipment; Appreciation of all safety features.

Unit 12: Review:

Module Assessment

1 Assessment & 1 Exam

Components	Percentage	Required
Assessment 1	40%	
Assessment 2		
Examination	60%	
Other		

Special Instructions

Assessment: An individual piece of written work on operations management and quality assurance chosen by the lecturer. The student will be expected to demonstrate their ability to identify and critically assess an element of operations management as it is applied to the baking industry and in the context of a chosen organization. The student will be required to present a report on their assignment of 2000 words not including references and appendices.

Written Examination: Questions will centre on the students knowledge, understanding and comprehension of the application of operations management and quality assurance in the bakery and food industry as covered in this module.

Module Title

TFBK3026 Baked Foods Product Development

Module Description

The consumer is becoming increasingly more sophisticated and demanding, particularly in relation to food. The purpose of this module is to encourage the learner to develop an in depth knowledge of new food product development.

Module Aims

The consumer is becoming increasingly more sophisticated and demanding, particularly in relation to food. The purpose of this module is to encourage the learner to develop an in depth knowledge of new food product development.

Learning Outcomes

Demonstrate a theoretical understanding and knowledge of the concepts of new baked food product development. Critically evaluate the steps involved in the production of new food products. Exercise appropriate judgment in the development of a range of products that are potentially attractive to a targeted market and feature safety, convenience, quality and value. Analyze the main trends and innovations in baked food products particularly with regard to packaging.

Learning and Teaching Methods

Learners will be encouraged to engage in their own learning through knowledge acquired in the practical modules taken in years one and two, and the test baking and evaluation module.

Indicative Content

1. Product Development Brief. Setting the scene – the need to develop new products. The concept of added value. The elements of successful product development. Baked product trends – international and national market trends. New products and the baking industry.
2. Identifying the need. Market research and idea generation. Consumer Research. Packaging – introduction to packaging technology.
3. Developing the concept. Idea viability. Target market –
4. Preparing the brief. Establishing a clear brief – elements of the brief. Planning for the development of the product.
5. Feasibility. Is the idea feasible? Sample preparation and presentation. Experimental design and procedure -
6. Implementation – stages in practical product development. Planning, project management identifying resources. Time plan and schedule.
7. Implementation. Stages in practical product development
8. Prototype development. Preparation of the product for sensory analysis and shelf life analysis.
9. Prototype development.
10. Prototype development and test
11. Prototype development and test
12. Oral presentation of stages involved in market research, concept development, producing the baked food product. Marketability of the product.

Module Assessment

Components	Percentage	Required
Assessment 1	30%	
Assessment 2	70%	
Examination		

Module Title

TFBK3025 Baked Foods - Product Testing and Analysis

Module Description

The majority of baked foods are complex mixtures of different ingredients, which must be of a particular specification and in the correct ratio to each other. This module will enable the learner to understand the chemical and physical changes that occur during preparation, baking and storage of baked food products and will demonstrate the importance of baking tests as a means of evaluating raw materials and processing procedures.

Module Aims

To develop the skills of scientific enquiry and investigation into the preparation and processing of baked food products by understanding the changes that occur in the formulation and to enable learners to understand the validity of formula specifications, and relate them to large scale production. This module aims to develop the learners' knowledge and understanding of the physiochemical nature of baked food product in relation to the behavior of food during preparation, processing, baking, cooling and storage, and to develop learners critical understanding of recording information and report writing.

Learning Outcomes

Demonstrate a theoretical and technical understanding of the concepts of recipe formulation ingredients and product specifications in the formulation of a variety of baked goods.
Exercise appropriate judgment in the planning, design and interpretation of results in a baking test
Critically evaluate the role of the principal ingredients in the quality, processing and structure of baked products
Demonstrate an understanding of the role of proteins, emulsifiers, enzymes and compound dough conditioners and the mixing process in the quality of the product.
Critically evaluate the role of liquids (egg, milk, water, other) and their effects on the baking process.
Utilise diagnostic and creative skills in the selection, combination and baking of food on the basis of scientific principles
Take initiatives to identify and address personal and professional learning needs.

Learning and Teaching Methods

The teaching strategies will include:
Lectures and Laboratory Practical. Learners will be actively encouraged to engage in their own learning through knowledge acquired through lecture, tutorials, videos, and projects.

Indicative Content

1. Introduction: Setting the scene. The concept of test baking: Define and set standards for the finished product, having regard to the market aimed at. Including specifications for recipes, size and weight of

product, details of processing and estimation of shelf life. System for recording of all data and observations and report writing.

2. Laboratory (test bakery) tests: Demonstration of the standard methods of baking tests using a variety of ingredients and manufacturing methods in a controlled manner. Assess the baking performance of Formula balance.

3. Sensory testing methods: The human senses – taste, smell, sight, touch and sound. Individual and group sensory tests. Research and assessment. Factors affecting sensory assessment. Stimulus errors, logical errors, leniency errors, contrast errors.

4. Cereal flours: Individual and group research and assessment of the baking performance of a range of cereal flours in the production of pan bread under controlled conditions.

5. Yeast fermentation: Individual and group research and assessment of the baking performance of yeast (dried; cream and compressed) in the production of pan bread while applying variations in both temperature and time controls.

6. Salt: Individual and group research and assessment of the baking performance and sensory analysis of varying levels of salt in the production of pan bread. The role of salt in baked food, the average daily intake, the RDA and effects of reduced levels in baked foods.

7. Enriching agents: Individual and group research and assessment of the baking performance of pan bread while applying variations in a variety of enriching ingredients including fats; oil; sugars; milk and malt.

8. Cereal flours: Individual and group research and assessment of the baking performance of a range of cereal flours in the production of cake, sponge cake and pastry under controlled conditions. 9. Enriching agents: Individual and group research and assessment of the baking performance of a range of hydrogenated vegetable oils, butter, emulsifying agents and the role of fats in baked food and uses as a cooking medium.

10. Aerating agents: Individual and group research and assessment of the baking performance of a range of aerating agents and the roles they texture control. Performance assessment of different cake making systems.

11. Formula Balance (pastry): Individual and group research and assessment of the baking performance of a range of ingredients in the production of a wide range of sweet and short paste mixes. Performance assessment of different pastry making systems.

12. Formula Balance (puff pastry): Individual and group research and assessment of the baking performance of a range of ingredients in the production of a wide range of puff and yeasted pastry formulations. Performance assessment of different pastry making systems.

Module Assessment

3 Assessments

Components	Percentage	Required
Assessment 1	20%	
Assessment 2	20%	
Examination		
Other	60%	One group assessment

Special Instructions

The module will be assessed as follows:

End of semester project and written report. (60%)

One individual assessment, (20%)

One group assessment, (20%)

The project will be centered on the learners knowledge, understanding and comprehension of scientific principles pertaining to the ingredients, formula balance, production methods.

APPENDIX F

Coded Interview

Interview One

CODES are highlighted in Red.

Question 1

In the last decade has there been a change in curriculum practice at the NBS?

Yes there has been much change, the Diploma in Bakery Production and Management was replaced by new programmes including 5 professional development programmes. Bakery apprenticeship training was finalised along with the sugar craft courses. The Higher Certificate course was introduced and then phased out to be replaced with the Ordinary Degree course. **Delivery methods** have also changed with the introduction of baking modules. These new modules also streamlined the course to fit in with general **modularisation** of courses throughout the DIT.

Question 2

In the past decade what do you see as been the main contributors to a shift in curriculum?

The main contributors to the shift in curriculum has been due to a number of factors including the following

- a) The general change in the bakery industry, less craft bakeries, and more in house baking carrying out their own **in-house training**.
- b) Lack of interest in **apprenticeship**.
- c) Decrease in general whole-time student population requiring the need to diversify and introduce the **professional baking** programmes and a new whole-time certificate programme.
- d) More interest in artisan baking and a general interest in the art of baking
- e) **Farmers markets** and the emphasis on fresh **organic** preservative/chemical free authentic baked products.
- f) A person making enquiries on how to make products themselves as it was not possible to buy such products from bakeries.
- g) A general **revival** in home baking and an interest in 'REAL' bread.

Question 3

Has technology and science impacted on curriculum practice?

Not really because we have **gone back to the beginning**! The understanding of baking technology has meant that it is a fundamental subject area to make the professional baking courses more worthwhile. Baking technology is offered for CPD. Advances in technology has split the baking industry into two separate segments plant / industrial **factory** bakeries and **craft bakeries**. Scientific research is constantly releasing new facts. The merits of fortified

foods are one such thing, eg. folic acid. The NBS has introduced a module on Food **allergens and Functional** foods this is reflective of scientific research.

Question 4

What changes if any have been made at the NBS to facilitate a change in culture?

Many changes have been made as mentioned before the most significant has been the introduction of the part-time professional **hands on** baking courses, which assists in eliminating or diminishing any **language barriers**.

Question 5

Has economic growth impacted on curriculum development?

Economic growth has most definitely impacted on curriculum as the fruits of the celtic tiger were reaped many people had a greater **appreciation of food** in general. The open skies and cheap air fares meant more and more people **travelled** and with that got an **appreciation of craft artisan organic** products and the influx of **foreign nationals** also brought about change in the bakery market with these people seeking out products which were familiar to their diet hence the evolution of industry producing **ethnic products**. Some of these **migrant** workers saw a gap in the market themselves and a number of Polish and others opening their own bakeries and appearing at markets. People are more affluent and are willing to pay more for **quality products**. Those quality products were difficult to come by and the consumer was also recognising the range of quality products being produced and readily available all over Europe in the many cities people were visiting and wanted to get similar products in Ireland. Some recognised the gap in the market and began to produce quality **small scale products for markets, coffee shops and delis**. As their businesses grew and people wanted to learn more about the art of baking a demand in courses was sought with the National Bakery School being looked at as being the ideal place to do such a course, hence the huge success of these courses.

Question 6

Have consumer patterns impacted on curriculum design?

Consumer patterns have most definitely impacted on curriculum design. Some of the following changes are reflective of this,

- a) The introduction of **sour-dough** technology
- b) Inclusion of **gluten free** baking
- c) Individual work practices with **hands on** classes
- d) Classic cake and pastry making
- e) **Artisan** breads
- f) **Viennoiserie**

All of the above areas had to be developed for the inclusion on the courses because of general interest in the areas.

Question 7

Has there been a change in student profile with the introduction of modularisation?

Student profile has changed significantly. There are regular whole time students consisting of school leaving students and **mature** students. Part-time mature students over 23. There are no

longer any apprentices whom were aged from 16 upwards. All our student profiles are 18 upwards.

Question 8

Has DIT Policy and National or European Legislation impacted on curriculum design? (Bologna Agreement 1999) and the DIT Act 1992.

Yes as we must validate courses in accordance with **DIT Quality Assurance** procedures. Courses were designed in modular format to meet **ECT accreditation**.

Question 9

Does staff professional development within the NBS facilitate a change in curriculum design?

Staff professional development does facilitate curriculum change as all of the staff are **engaged in** professional development to meet the demands of curriculum change.

Question 10

Has collaboration between the National Bakery School and the German Baking Academy impacted on curriculum design?

Collaboration between the NBS and Germany has impacted on the curriculum design because of the inclusion of **three courses offered by the NBS in Germany** again this has been because of demand from students wanting to understand the industry and engaging in education with the masters.

THEMES

The following is a table of emerging themes from the data analysis carried out on the interviews.

Table 4: Themes emanating from interviews

Interview Questions	Emerging Interview Themes
Q1 In the last decade has there been a change in curriculum practice at the NBS?	Significant change namely, <ul style="list-style-type: none"> • Cessation of a number of courses. • Introduction of a new courses • Modularisation and semesterisation • Collaboration with Germany • Course Delivery • Course Content
Q2 In the past decade what do you see as been the main contributors to a shift in curriculum?	Changes brought about by, <ul style="list-style-type: none"> • Consumerism • Bakery Industry • Student Profile • Personal interests • Health Consciousness • Travel • Entrepreneurship
Q3 Has technology and science impacted on curriculum practice?	Technology has affected, <ul style="list-style-type: none"> • Student Learning • Course Delivery • Segmentation of the Bakery Industry Science has impacted on, <ul style="list-style-type: none"> • Safety and Hygiene • Initiated new modules ie. Food Allergens and Intolerances and Functional Food • Laboratory Science (more restricted)
Q4 What changes if any have been made at the NBS to facilitate a change in culture?	Many changes, <ul style="list-style-type: none"> • Modularisation and Semesterisation • Course content • Course flexibility • Course delivery, hands-on practical classes diminished language barriers • Transferability with ECTS. • Retention of collaboration with Germany
Q5 Has economic growth impacted on curriculum development?	Increased demand for part-time courses. Mainly due to, <ul style="list-style-type: none"> • Increased disposable income • Travel • Employment • Immigration • Consumerism • Bakery Education awareness.

	<ul style="list-style-type: none"> • Food Appreciation • Entrepreneurship eg. niche markets • Quality Consciousness.
Q6 Have consumer patterns impacted on curriculum design?	<p>Course content now appeals to a broader spectrum of Individuals including,</p> <ul style="list-style-type: none"> • Multi-cultural • Multi-denominational • Food connoisseurs or 'Foodies' • Health and environmentally conscious.
Q7 Has there been a change in student profile with the introduction of modularisation?	<p>A change in student profile is evident based on,</p> <ul style="list-style-type: none"> • Age • Gender • Nationality
Q8 Has DIT Policy and National or European Legislation impacted on curriculum design? Eg (Bologna Agreement 1999) and the DIT Act 1992.	<p>The two key emerging themes were,</p> <ul style="list-style-type: none"> • Quality Assurance • Modularisation
Q9 Does staff professional development within the NBS facilitate a change in curriculum design?	<p>Staff professional development has influenced,</p> <ul style="list-style-type: none"> • Course content • Course delivery • Scholarship
Q10 Has collaboration between the National Bakery School and the German Baking Academy impacted on curriculum design?	<p>Collaboration with Germany has enhanced,</p> <ul style="list-style-type: none"> • Course content eg. sour-dough technology • Course delivery, student participation at source. • Networking eg. 20/21 Initiative • Standards